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MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
Statistical Division, April 19, 1873.

SIR: I present herewith, for publication, a report of the condition of winter grain throughout the United States in the first week of April; a statement of the condition of farm-animals during the past winter, and of the prevalence and fatality of diseases among them during the past year; also, consular communications, (relating respectively to the "vine disease of France," and to "Dutch or Holstein cattle;") a letter from an official veterinary surgeon of France upon "epizootic catarrh;" a communication from Hon. R. B. Roosevelt on fish-culture; an account of the operations of the United States Commission of Fisheries, with statistics of markets, and "facts from various sources."

Respectfully,

J. R. DODGE, *Statistician.*

Hon. FREDERICK WATTS, *Commissioner.*

CONDITION OF WINTER-WHEAT.

On the first week of April a considerable portion of the northern belt of the winter-wheat area was covered with snow. The condition of that which was visible gave promise of general exemption from winter injury, leaving the crop subject to the meteorological vicissitudes of April. In the Middle States a great improvement upon the showing of last spring is everywhere conceded, especially in New Jersey and Pennsylvania. The prospect in the States south of Maryland is less favorable than last year, and there are indications of diminishing area in the cotton States, though acreage is not intended to be given in this report. Michigan, the only State of the northern border in which winter-wheat is mainly grown, presents green and vigorous growth, wherever snow has disappeared sufficiently to reveal it; and Ohio makes far more favorable returns than last year. In Kentucky a more checkered showing is made, giving the present appearance a decidedly unfavorable cast, with indications of future improvement as the weather becomes settled. In Indiana and Illinois the unfavorable returns outnumber the rose-colored; the dry autumn retarding seeding and germination, and leaving the plants too weak and shallow-rooted to endure well the effects of winter's changes of temperature. Similar causes affect the condition of wheat in Missouri, but a great improvement over last year is reported; and a still more favorable condition exists in Kansas. In Wisconsin, Minnesota, Iowa, and Nebraska, as is known, very little winter-wheat is produced, but full reports are given of such experiments. The indications from California all point to another year of great abundance, scarcely a county reporting unfavorable condition. As

a whole the wheat prospect at the close of winter is more favorable than at the same date in 1872.

There are places in the New England States where a portion of the very limited wheat area of that section is preferably sown with some hardy winter variety. If the protection of snow is unfailing, the growth of such wheat will be vigorous the present spring, the surface generally having been well covered in much of the northern belt from 2 to 5 feet deep. In York, Maine, the ground was covered from November 21 to April 1, when the tops of the stone walls began to appear. At the same date the snow was 5 feet on a level in Somerset, Maine, from 2 to 4 in Sagadahoc, and nearly as much in other counties. Two to 3 feet of snow covered the ground in nearly all of New Hampshire; there was a covering of 5 feet in Orange, Vermont, and ample protection in all parts of the Green Mountain State. Bristol is the only county in Massachusetts which reports wheat as visible, and there the fields are green and growing. The prospect in Hartford County, Connecticut, was never better; "wheat," in New London, "is better than for years," other counties reporting it as either not grown or covered with snow.

In New York there was much snow on the ground on the 1st of April. In Otsego County there had been one hundred and twenty consecutive days of sleighing; in Washington the surface had not been visible since the last of November; in Warren wheat was covered with 3 feet of snow; 2 feet were reported in Oneida; in Greene a covering of snow remained after December 15; and the wheat-fields were covered in Rensselaer, Suffolk, Montgomery, Chenango, Livingston, Jefferson, Delaware, Genesee, and other counties. The crop "looks remarkably well" in Sullivan; "fine" in Rockland; makes a good appearance in Albany and Tioga; is 25 per cent. better than last year in Yates, and in Seneca the plants are "small but healthy," and coming into fair condition. In Chautauqua it was quite badly frozen; in Erie a dry fall and severe winter leave the crop in an unfavorable condition; in Cattaraugus below average, and it is reported below average in Chemung, though the plants appear to possess vitality which promises vigorous growth in good weather. In Onondaga wheat "is not looking very fresh," the top being touched with frost, though it stands well, and the roots are alive; in Monroe the appearance is not an average. An average prospect appears in Niagara, Albany, Kings, Dutchess, and other counties, and little apprehension is expressed of the crop in the many localities covered with snow, though the weather of April may make a material change in the crop prospect.

Reports are received from two-thirds of the counties in New Jersey, all of which are favorable, with the exception of those from Salem and Cumberland, where evidences of the winter's severity are visible. The prospect is better than for three years in Sussex; in Cape May the early-sown fields look particularly green; in Warren a fine stand and vigorous growth are seen; Bergen makes a better show than usual, and other counties report average condition.

In many of the counties of Pennsylvania the ground was yet covered with snow; an aggregate snow-fall of 8½ feet is reported in Wayne; in Elk snow was 7 to 8 feet deep in situations, and there were drifts 12 feet deep. Very few reports indicate unfavorable condition, including those of Armstrong and Westmoreland; in Indiana the plants were "thrown out" to some extent by frosts; and in Fulton the early-sown fields were somewhat injured by the fly. In Adams the prospect is "better than for some years;" the crops "remarkably fresh and vigorous" in York; "condition seldom better" in Pike; "very promising" in Cumberland; in Northumberland so luxurious in the autumn that it was

pastured down; and favorable returns come from Wyoming, Lebanon, Erie, Wayne, Lancaster, Lawrence, Luzerne, Huntingdon, Mercer, Lehigh, Cameron, Chester, Lycoming, Tioga, and many other counties.

Warren County, Pa.—The steady cold winter, with the ground almost constantly covered with snow, has been highly favorable to winter grain. I have a piece of winter-wheat that looks as well as any I ever saw at this time of the year. The ground produced a fair crop of hay in July, was plowed about the 10th of August, manured on top after plowing and was sowed on the 21st of August. About twelve loads of barn-yard manure, made the previous winter, was used to an acre.

In Delaware a full average condition is scarcely attained; Sussex reports 10 per cent. below, and Kent a fair prospect for upland fields.

An average condition of wheat appears in Maryland. In Montgomery, Somerset, Saint Mary's, Queen Anne, inferior condition is reported; the crop was well protected and is very promising in Washington; "healthy and vigorous" in Baltimore; decidedly good in Carroll; average condition is reported from Ann Arundel, Howard, Cecil, etc.

Queen Anne County, Md.—Wheat is looking badly, but within the past few days has made wonderful improvement. The best fields are marred by spots of winter-killed. It is yet too early to estimate the damages. Close observation, however, has convinced me that, even on flat lands, the drilled is much less injured than that sown broadcast. I tried an experiment this winter on a piece of land where wheat has sometimes been injured heretofore. On one-half I plowed in the wheat on four-foot corn ridges, the other half I drilled flat, and I now feel sure that the drilled wheat will yield fully one-third more than the other.

Saint Mary's County, Md.—The general condition of winter-wheat is *bad*. Much of it was seeded too late; the summer fallowing, owing to the dry weather, was too late to insure a good stand. It has been the worst winter on wheat that I have known for thirty years. Very heavy rains followed by intense cold. All wheat in wet or low lands is entirely destroyed, and the prospect for wheat and grass is very bad. No rye sown in the county of account.

More than fifty counties in Virginia made reports, nearly all more or less unfavorable. In Loudoun, "usually good;" in Prince George the crop looks well where the drill had been used in seeding, and in Orange it was promising, especially the drilled fields; in Nansemond, James City, and Northampton it was above average, and in Rockingham, except where the fly had injured a few early fields. It made a bad show in Spottsylvania in March, but has recovered a good degree of vigor. It was reported improving in Amelia, Augusta, Grayson, Frederick, and other counties. Heavy rains in February were injurious in Accomack; a few early-sown fields in Madison look well, but most of the area in wheat is unpromising; in Greenville the injury from frost was severe, but less so in drilled fields; in Middlesex the appearance was worse than for years. Some counties merely report "backwardness" and slow growth, which favorable weather will measurably remedy, and the apparently winter-killed may realize a similar improvement.

Essex County, Va.—Wheat looking badly—25 per cent. below average. One-third of the best wheat on the river-bottom has been winter-killed for want of proper drainage. That on rolling land is in an average, condition.

Henrico County, Va.—Wheat and rye are both looking badly, and as unpromising as may be. But the failure seems to be simply want of growth. It may be that a few really seasonable days will bring these crops out so as to change the prospect wonderfully in a few weeks' time. I do not think there is any serious defect except the cold, unpropitious weather, which has prevented growth and development.

Nearly three-fourths of the North Carolina reports indicate "backwardness, or "winter-killing." Stanly reports a good stand and superior prospects; Greene returns a good stand of small growth; in Mecklenburgh, Lenoir, Catawba, Madison, Carteret, Sampson, and Hertford, wheat presents a fair appearance; in Iredell it is in poor condition, except where fertilizers were used. Indications of improvement, under the influence of mild weather, is reported from various quarters.

Stokes County, N. C.—The stand is good, except in red puffy land, and even that kind of land has good stands where the drill was used. But as we have but little of that kind of land I will report an average stand.

Harnett County, N. C.—Winter-wheat and winter-rye are both in an average condition. As a general thing the ground was well prepared and the grain carefully put in.

Stanly County, N. C.—The condition of winter-wheat is good. The stand is excellent, and in many sections the growth is forward. The Tappahannock takes the lead in thrifty appearance, and the Fultz next. From the present looks of the Touzelle it promises to be a success; it tillers more than all the rest.

There is little wheat grown in South Carolina, or in any of the cotton States, except Tennessee and Texas. About half the reports from the former State are favorable, the others indicating a poor stand and unthrifty condition. Eleven counties in Georgia report condition from average to good, and thirty-two below average. Several report no wheat raised. The crop is "very good" in Dooly; "better than usual" in Jackson; "promising" in Laurens; "best for several years" in Troup. Of the counties reporting wheat in Alabama, about one-half make favorable returns; in Mississippi some injury from freezing is indicated, but fields look well in a majority of the counties in which any is sown. In Lee and Coahoma the Department wheat was in superior condition. Scarcely any wheat is sown in Louisiana, except for winter pasture, for which purpose rye is generally preferred. Three-fourths of the wheat reports of Texas are favorable. Grasshoppers partially destroyed the crop in Kendall, Atascosa, Bandera, and Medina. The prospect was never more favorable in Hunt; very fine in Leon, Lamar, and other counties. In Arkansas unfavorable reports predominate slightly. In Izard, condition is placed at 125, and in Marion the crop is almost a failure.

York County, S. C.—Winter-wheat appears to have fared badly. The frequent and sudden changes of temperature, during the winter months, with thaws and freezings, operated greatly to its injury. Much of it, on light sandy soil, is apparently killed out. The French Touzelle, of which I drilled three quarts, on a light loamy soil, seems to retain a full stand, and appears more vigorous at this writing than the Tappahannock, drilled beside it. Four acres of Tappahannock, sown broadcast, on a different soil, containing more clay, has wintered better than any other variety I have, except the Touzelle.

Cobb County, Ga.—The comparative condition of winter-wheat is bad. There is much complaint of winter-killing on the high lands. On low lands the wheat is drowned out and washed away by the freshets caused by the heavy rains.

Gilmer County, Ga.—Owing to late seeding, excessive rains and freezes just after floods, the crop of winter wheat and rye is very badly injured.

Laurens County, Ga.—There is very little wheat sown. Planters have often been disappointed by rust, and many discouraged, but those who sow yearly find it very profitable for home use. Every planter can raise his wheat if he will, especially by getting his seed from Virginia or Maryland every second year at least. I have tried this plan and am well pleased with it. Our planters have run into the ruinous error of planting too much cotton to the neglect of provision crops. It is bankrupting the country.

Gadsden County, Fla.—Wheat in this county is only on the scale of an experiment. That from the seed sent out by the Department is doing very well, and gives flattering promise of perfect success. I measured some bunches of the Virginia variety which gave a height of 3 feet 9 inches, and from present indications will begin to head in the course of ten to fifteen days. The French wheat is not quite so tall, but both are well tillered. It was seeded on the 1st of November, and has not been the least affected by the cold.

In Tennessee the unfavorable returns outnumber the promising. The growth is generally small for the season, scattered and patchy, but rapid improvement is indicated at points where the season has been favorable for rapid development.

Montgomery County, Tenn.—Smaller than usual on account of late planting, and thinner than usual on account of the freezing out. My opinion is that we shall have a better crop than is expected. There is no telling the "come out" in wheat. But there is no doubt about it, wheat and rye are badly injured. We will know by the middle or last of April.

Monroe County, Tenn.—Wheat sown on clover-fallow is looking well, especially the early sown. That on stalk-land is badly winter-killed.

In more than half the counties of West Virginia there is complaint of injury from frost or unthrifty appearance. Warm weather will greatly improve the latter defect. The principal injury appears to have been done in March, after the disappearance of the winter's snow. While the surface became bare in places, the temperature was too low for growth, even in counties so far south as Cabell. The counties in which it looks best are Jefferson, Hancock, Taylor, Pocahontas, Tyler, Berkeley, Barbour, Hardy, and Morgan. It is 20 per cent. better than last year in Berkeley, well tillered and vigorous. Where it is fairly started in these counties it is growing fast.

In most of the counties of Kentucky the appearance is reported unpromising. In Shelby the "early sown stood best; the early drilled seems to have done better than broadcast;" in Warren it is "good, better than expected:" in Lawrence "good on new land;" in "fair condition" in Boone; "looks tolerably well" in Trimble. It is thought that few fields will be worth harvesting in Jackson; in Livingston wheat is poorer than for many years; and fields have been plowed up in Owsley and Russell.

Hardin County, Ky.—Wheat is in a poor condition; you would hardly recognize any wheat in three-fourths of the wheat-fields, at a distance. Drilled wheat is still in the ground, but broadcast is badly lifted out by freezes. Rye looks badly; it made no growth last fall.

Fayette County, Ky.—Wheat has wintered badly: that which was drilled on clover-ground has done well; all other kinds much injured, probably to extent of 30 per cent. Rye has done very well.

In Ohio the returns, which are quite general, are favorable in a large proportion of the counties. Among those in which condition is most promising are Ashland, Adams, Ross, Vinton, Erie, Geauga, Morgan, Stark, Perry, Fairfield, Jefferson, Defiance, Crawford, Lorain, Logan, Mahoning, and Warren. In Noble it is better than for many years. In Morrow many fields, sown early, look well. The counties making less favorable reports are Carroll, Delaware, Meigs, Marion, Medina, Scioto, Wyandot, Washington, and Urbana.

Athens County, Ohio.—Made little growth before winter. Have had many cold, chilly winds, killing much grain, and rendering that left alive very weak and unpromising.

Williams County, Ohio.—Winter-wheat, just now, is looking very badly. It was covered with snow all winter until the last week in February, when there was a thaw that melted the snow all off, leaving the wheat very green and tender-looking. Then there was a change in the weather, the thermometer running down to 8° below zero in about twelve hours. And since then wheat looks as though it had been considerably scorched, in fact a great deal of it is entirely killed.

The crop was well protected by snow in Michigan, (the principal winter-wheat-growing State of the Northern border,) and scarcely any returns indicate unpromising condition. Ice has caused some injury to fields in Branch, and to some extent in Wayne. In many counties the covering of snow was not yet removed, and a possibility existed of injury by sudden changes of spring weather. In Saint Joseph the prospect was somewhat above an average, but not quite so good as last year. In Montcalm the crop "never looked better," and was above average in Lenawee, Lapeer, Macomb, Jackson, Ottawa, Washtenaw, and Shiawassee. A majority of the counties report average condition.

A few counties in Indiana report superior condition. In Shelby, "better than for several years;" in Randolph, 23 per cent. better than last year; in Scott, above average; in Hancock there appears a difference of one-third in favor of drilled wheat. In sheltered locations the crop looks well in Laporte. In many counties there was little snow,

with cold winds, resulting in injurious freezing, except upon spots covered with snow or sheltered by timber. The winter-killing was worse than for several years in Wayne, Carroll, Perry, Edwards, and Macon, a part of the area in the latter being plowed up and sowed to oats. Of the remaining counties reported, about forty in number, about half indicate average condition.

Decatur County, Ind.—The condition of wheat is bad; the figures 60 would probably approximate the comparative condition. Much of it was actually frozen to death. The first week of March was nearly as cold as any part of winter, while the ground was bare of snow, and frequent freezing and thawing has damaged it badly.

Howard County, Ind.—The drought of the fall caused considerable wheat to perish after germination, and what survived to be small, but the snows have so protected it from injury during the winter that we have reason to hope that a favorable spring will give us a full average crop.

Morgan County, Ind.—Wheat is fully 100, but in low, undrained land will, undoubtedly, be injured by the recent rains, as the ground is full of water.

Parke County, Ind.—The condition is a little above the average of seasons, from the fact that wheat was drilled and the ground better prepared than usual. March has been the hardest month of the winter on wheat.

Warrick County, Ind.—The present prospect of winter-wheat is good. The unusual amount of snow (counteracting the severity of the weather) seems to have furnished a natural stimulus, and greatly vitalized the appearance and growth of this cereal.

In Illinois the reports range between average and "bad," very few "good." Some fields were still covered with snow, others were bare, the wheat scarcely started, or growing very slowly. Drought was severe in many counties last fall and germination late, wheat making little show at the beginning of winter. Where covered with snow it is in vigorous condition. In Hancock it is noted that "the drilled looks 3 per cent. better than the broadcast." In Pike the bottom-lands promise a good crop; in Clark early-sown wheat looks well. In Macon half the area has been plowed and put in oats and spring wheat; in Edwards the prospect is "worse than ever known."

Perry County, Ill.—Three weeks ago wheat appeared to be in a wretched condition. Since that time its appearance has improved, so that it is now nearly an average condition.

Vermillion County, Ill.—Wheat looks well considering the very dry weather at seeding-time. Plants got a poor start last fall, but have come through the winter well. The crop will probably be below an average per acre, and not more than two-thirds of a crop sown.

Saint Clair County, Ill.—Winter-wheat has been excellently protected by a fine covering of snow, and hence has very much improved under the snow, and fields that looked quite bare last fall are now green with fine growing wheat. We have to-day (March 26) another severe cold spell, with about one inch of snow on the ground, and the thermometer down to 20° above zero. I do not think it will affect wheat in the least.

Cook County, Ill.—We long since ceased to gamble on winter-wheat growing. Every shilling we ever made on an average cost us $1.

Sangamon County, Ill.—Winter-wheat, where drilled in, looks fair; that sown broadcoast is mostly destroyed. Winter-rye looks well.

Franklin County, Ill.—The comparative condition of winter-wheat with us now is very unfavorable indeed, owing to the very dry summer and fall. Very much wheat that was sown at the usual time, from the 12th to 20th of October, did not come up last fall, or if it did the plant was very feeble. During February we had a warm spell of weather, which caused much of it to sprout, but it turned very cold again, with high dry winds, which killed most of the plants, and much of the seed rotted. At present many fields have a barren and diseased appearance, and many fields are being plowed up for corn, and many others will be. There are some fields that show a fair prospect, and which were mostly drilled or the seed plowed in.

The winter-wheat of Wisconsin, Iowa, and Minnesota is scarcely worth mentioning, except to show the possibility of growing it. It is reported in good condition in Trempealeau and Marathon, (Wisconsin;) average in Adams, Dunn, and Kewaunee; but generally injured by freezing. In Dodge County there is 50 per cent. more grown than for-

merly. In Minnesota it is said to be in good condition in Becker, Isanti, Goodhue, McLeod, Houston, Sibley, Steele, and Washington. In Winona it is badly injured where not sheltered.

Rice County, Minn.—Winter-wheat is not a sure crop with us, though in some seasons it has yielded splendidly, from 25 to 40 bushels per acre. This was the case two years ago; but last year it was nearly a failure. Spring-wheat is more reliable, and is in fact worth more per bushel than winter.

Scott County, Minn.—But very little is planted in this county. What is needed here is a hardy winter variety. Four quarts of a winter variety, which I received from the Department in the fall of 1871, was planted as late as October 1. The product of the four quarts was four bushels, which was sown last fall. The snow has just disappeared, and this wheat is looking very well. Rye generally looking well. But little is sown.

Carver County, Minn.—Winter wheat and rye look very well, but the growth of winter-wheat is too much neglected. The farmer should not be discouraged by one failure, which they will have sometimes. The yield is five bushels to the acre more than spring-wheat, and the price fifteen cents per bushel greater. Tell them to try more winter-wheat; it will pay. If it fails the land is in better condition for spring crops.

Iowa reports a very small area in poor condition. In Fremont that which was drilled was good; Ringgold, good; Appanoose and Jefferson, average; winter-killed in Wayne, Adams, Lucas, Johnson, Polk, Allamakee, Madison, Marion, Louisa, Jackson, and Des Moines. "None grown" was the report in a majority of the counties.

Montrose County, Iowa.—Winter-wheat presents a worse appearance than for many years, though the drill has been almost universally used. This is accounted for because of the character of our snows during the past winter. Although we were visited by heavy snow-falls, it was so dry and accompanied by such strong winds that the snow was drifted to a great depth in lanes, roads, and against fences, while the great body of the field would be comparatively bare. Being thus without cover and exposed to unheard-of freezes, there will be little winter-wheat except on fields protected by bluffs or next to the fences where it was covered with snow. Winter-rye looks well.

Page County, Iowa.—Fall-wheat looks very bad, especially that sown by hand, many fields being entirely killed. The drilled is much better, but under the most favorable circumstances will not produce more than half or two-thirds of an average crop.

The promise is better in Missouri than last spring, but still not good. In Clinton the prospect is "very good;" "better than usual" in Adair; "unusually fine" in Benton; "better than for three years" in Johnson, and doing well in Shelby, Linn, Reynolds, Pettis, Daviess, Callaway, Ralls, Lawrence, and other counties. In Carroll early wheat looks well; in Moniteau that protected by timber is safe; "not quite so well as usual" in Stoddard; "50 per cent. better than last year" in Montgomery; "better than last year, but not first-rate," in Jackson. With good weather and exemption from insects, there is still a possibility of an average crop.

In Kansas a still better prospect is indicated. In Linn wheat looks "as well as it ever did;" in Montgomery it was "never better;" "better than for five years" in Neosho; "very fine" in Crawford; in Bourbon "200 per cent. better than last year;" the "prospect could not be better" in Cherokee. Rain is needed in Marion, and in Osage the winter's rains wrought some injury. In Shawnee "drilled wheat is good;" in Jefferson "early-sown is very fine;" in Marshall "late-sown is badly killed." Several counties return complaints of poor condition, among them Lyon, Chase, Ellsworth, Rice, Washington, Smith, Ottawa, and Riley.

Audrain County, Mo.—Winter-wheat looks very well, but a small area sown on account of the chinch-bug being so destructive. Very little rye sown for the same reason.

Franklin County, Mo.—Wheat, on land well prepared and the grain drilled in, looks well.

Greene County, Mo.—Wheat is very backward, but on account of an unusual amount of snow this winter it is looking well. Ground well covered.

Jasper County, Mo.—Wheat looking 25 per cent. better than April 1, 1872, drilled be-

ing in better condition than broadcast, and early drilled looking much better than late.

Vernon County, Mo.—Winter-wheat was mostly sown very late on account of chinch-bugs, and can now hardly be discovered. Has not stooled any as yet, but the bud is healthy and looks as well as usual for this time of year except being late.

Wilson County, Kans.—I have never, in any State, seen a better (if as good) prospect for an abundant wheat crop than we have here at this time.

Labette County, Kans.—Better than ever was known in the county, and it goes to prove the facts that care in seeding, sowing early, and using drills is the great secret of raising wheat. We have now (April 1) any number of fields on which the wheat is from four to six inches high, in which a rabbit can hide.

Republic County, Kans.—Winter-wheat is in fair condition; that plowed or drilled in quite early on new ground, or very late, decidedly the best. Ground four or five years old and in good condition (very loose) is killed some. The winter has been severely cold.

Woodson County, Kans.—An unusual snow-fall has favored the wheat crop, and the prospect is good for a large yield. The winter held on steady until the first of March, and then a fine rain fell, and spring, with its joyous sunshine, set in, and farmers are jubilant over the prospect of a fruitful season.

Doniphan County, Kans.—Winter-wheat was somewhat damaged, and much of the finer kinds killed outright. Tappahannock wheat, sent out by the Department, was sown on excellent ground, came up and grew nicely, but was killed by the first hard frost. One hundred acres Lancaster wheat, sown by a neighbor, was killed. Much of the wheat sown on old ground is killed or injured, more or less. Wheat sown in corn-fields or on new ground is much better.

McPherson County, Kans.—There were about 2,000 bushels sown last fall, but the condition of it now is very hard. I would say that about half of it is dead. This failure is the fault of the farmers, as they are mostly all new beginners in that business.

The reports from California are very encouraging. There is no positive statement of poor condition. In Stanislaus it is stated that wheat is not equal to that of last year by 10 per cent., and that rain is needed. The prospect is better than several years in Mendocino. The plant is thought to be forward for the season in Del Norte. Rain is needed in San Diego. The following extracts further illustrate the condition of wheat in California:

Placer County, Cal.—I answer by saying that during a residence of twenty-three years in this county I have never seen the prospect for wheat as good as at the present time. If there is nothing happens to our wheat crop it will astonish the world.

Alameda County, Cal.—Wheat and other grain is looking full more than average at this season of the year, and if nothing should befall the crop we will have an abundant harvest. There was a larger breadth of wheat planted the past fall and winter in this State than ever before in one season. Many fields of early-sown wheat now stand over two feet high.

Santa Clara County, Cal.—Wheat is in good condition; never more promising at this season of the year than now. An occasional rain from now until the 1st of May, and the harvest of 1873 will be the most bountiful ever reaped on this coast by 75 per cent., provided the rust and smut do not attack the crop.

San Joaquin County, Cal.—Grain of all kinds never looked better or more promising at this season of the year, and never has there been so large a surface covered, with wheat particularly. It is estimated that over 50,000,000 bushels will be raised in the State.

Contra Costa County, Cal.—Our rainy season setting in early was favorable to early seeding under most favorable conditions, and justifies the hope of a very abundant yield, even an increase on our last year's crop. Earliest wheat and barley from 6 to 12 inches high and very thrifty, with slight exceptions.

Sonoma County, Cal.—Our winter-sown wheat is in very fine condition, and never were the prospects more flattering for a bountiful crop as at present. Should we be favored with the usual spring rains Sonoma County will exceed in yield all its former crops and show a larger average yield than any other county in the State.

The prospect in Oregon is exceedingly good, not an unfavorable return being received. Several reporters say that the indications of a good crop never were greater.

CONDITION OF SHEEP AND CATTLE.

Though the past winter, over much the larger portion of the country, has been one of extraordinary and protracted cold, it has on the whole been favorable for farm animals. The weather has been comparatively uniform and dry. There have been comparatively few sudden changes and very few storms of rain and sleet followed by freezes. One consequence has been unusual exemption from wide-spread suffering and death which wet winter storms inflict upon unsheltered farm animals, especially sheep. The severity of the winter in certain sections has induced greater care, and more attention to feeding. Farmers are learning that care and kindness to these useful creatures are repaid with increase of profit. Our correspondent in Labette County, Kansas, states: "I have learned from observation that a cow, when well sheltered and watered, can be kept on less than one-half the feed required when left to the exposure of winter storms." Those who now neglect to provide suitable shelter in winter for their herds and flocks, if they would carefully observe and study results, would reach a similar conclusion. The agricultural districts in this country are very limited in which farmers can *afford* to winter stock without any provision for sheltering and feeding them.

In the Pacific States, and in the Territories, except Utah, the winter appears to have been unusually mild and pleasant. In the Gulf States, especially Texas, there has been an exception to the general exemption from storms of rain and sleet. The consequences, as will be seen from the figures and extracts which follow, are manifest in comparatively low condition and heavy losses. In the Northwestern States much suffering and considerable loss among cattle and sheep were occasioned by the unprecedented snow-storm of January 7. On the whole, taking the country together, owing to the circumstances above referred to, in connection with a general abundance and cheapness of feed, both cattle and sheep have come out of winter-quarters with much fewer losses, and in a condition much better, than average. The returns make it quite manifest that wherever they have been properly sheltered and fed, flocks and herds have come through the winter in a healthy, thrifty condition.

CONDITION OF CATTLE.

Out of 1,032 counties reporting with some degree of explicitness, 238 return average condition; 500 above, 294 below. New England returns 42 counties, 5 of which are average and 37 above. York, Maine, reports "never saw them looking so well;" Hillsborough, New Hampshire, "never better;" Chittenden, Vermont, "better than for a number of years;" Hampden, Massachusetts, "extra," and Franklin, "25 per cent. above average."

In some returns the description of relative condition is too vague to admit of classification as either average, above, or below. Such counties are not included in the classifications which follow. Under "average" are placed not only those so reported explicitly, but impliedly; such as, "in fair condition," "pretty good," "good as usual," &c; "above average" includes those returned as "in good condition," without any qualifying epithet, and all grades described by stronger terms, among which "excellent," "splendid," "first rate," "never better," "better than ever before," &c., abound. The extracts which follow the summary given in figures, will be mainly such, or specimens of such, as assign a reason for the relative condition.

States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.	States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.
Maine	10	9	1	.....	West Virginia	30	9	11	10
New Hampshire	6	5	1	.....	Kentucky	40	11	11	18
Vermont	10	8	2	.....	Missouri	55	32	13	10
Massachusetts	8	7	1	.....	Illinois	51	35	13	3
Rhode Island	2	2	.....	.....	Indiana	53	24	18	11
Connecticut	6	6	.....	.....	Ohio	43	25	11	7
New York	36	24	7	5	Michigan	28	22	3	3
New Jersey	14	8	6	.....	Wisconsin	29	16	9	4
Pennsylvania	41	24	12	5	Minnesota	34	19	11	4
Delaware	1	.....	.....	1	Iowa	60	42	12	6
Maryland	10	1	3	7	Kansas	33	30	2	1
Virginia	61	14	17	30	Nebraska	12	7	3	2
North Carolina	48	17	16	15	California	20	16	2	2
South Carolina	6	1	3	6	Oregon	6	5	1	....
Georgia	49	17	13	9	Nevada	1	1	.....	....
Florida	15	5	5	5	Colorado Territory	5	5	.....	....
Alabama	21	4	4	13	Dakota Territory	6	6	.....	....
Mississippi	28	5	7	16	Montana Territory	2	2	.....	....
Louisiana	20	8	1	11	Washington Territory	1	1	.....	....
Texas	53	7	8	38	Utah Territory	9	3	3	3
Arkansas	20	6	3	11	New Mexico Territory	1	....	1	....
Tennessee	43	10	5	28	Idaho Territory	1	1	.....	....

NEW YORK.—*Chemung:* Good. Hay having been scarce and dear, much grain has been fed, thus maintaining flesh and thrift. Grain has been relatively much cheaper than hay. Corn is worth in market $20 per ton; hay, $22; straw, $12. *Seneca:* Thrifty. Cattle and sheep, as a rule, are well sheltered and well cared for in this county. *Genesee:* Not as good as last year; still buried in snow, and many farmers short of fodder. Hay, $15 per ton.

NEW JERSEY.—*Warren:* Look better than for many years.

PENNSYLVANIA.—*York:* Poor, on account of scarcity of hay. *Cumberland:* Better than for many years. *Cameron:* Rather below average. Feed scarce. *Clearfield:* Better than usual. Feed plenty and cattle scarce. *Dauphin:* Looking unusually well. Long, severe winter, with scarcity of hay, but corn-fodder plenty; and it appears that cattle winter better on that than on hay. *Bucks:* Very good. Owing to the high price of hay and low price of grain, more grain than usual has been fed. *Beeves:* Better than was expected. Cheap corn and better care.

DELAWARE.—*Sussex:* Ten per cent. below average.

MARYLAND.—*Baltimore:* About 60 per cent. of the cattle are poor and much prostrated, owing to scarcity of hay, and consequent poor and insufficient feed. Many farmers, however, as well as dairymen, are keeping their cows in good condition. Experience has taught us that cows poorly fed are a loss. *Somerset:* Quite thin from scarcity of feed, occasioned by extensive drought last summer. *Howard:* Very poor; no grass last summer; no hay this winter. Feed scarce and high.

VIRGINIA.—*Clarke:* Worse than I have ever known. The winter has been intensely severe, and unusually long. Provender very scarce, and cattle were in poor condition when winter set in, in consequence of the long drought of last autumn. *Page:* Good, owing to much better care than formerly. Our people are providing good shelter for stock. We find a great saving in food by so doing. *Greenville:* Average. This people devote their time so much to cotton and tobacco that scarcely enough forage is stored for the work-horses; consequently, at this season of the year, it is no uncommon sight to see bales of northern hay hauled fifteen or twenty miles from the depots into the country. This hay, when brought home, costs at least $50 per ton. *Essex:* Exceedingly thin and poor. The increased acreage of cotton and pea-nuts has so lessened the quantity of forage that but few have been well fed. *Grayson:* Good breeds in good condition. So little attention has hitherto been given to proper sheltering that many, as heretofore, are in an emaciated condition. *Nelson:* Fair. Our farmers are slowly but surely learning the importance of sheltering their stock in winter. *Halifax:* Better than last winter. Too little attention paid to housing, feeding, and care of stock. *Fauquier:* Better than was expected. The low price of grain induced farmers to lengthen out the short supply of hay by feeding more grain. *Madison:* Bad, owing to severe winter, scarcity of food, and careless treatment.

NORTH CAROLINA.—*Chowan:* Bad, owing to the extremely cold and wet winter. *Rutherford:* Good. Feed plenty.

SOUTH CAROLINA.—*Clarendon:* Very poor, owing to intensely cold winter and want of food and shelter. *Chester:* No winter quarters to come out of.

GEORGIA.—*Harris:* Pretty good. The hardest winter we have ever experienced. *Dawson:* Those that have been housed look well; those that have been exposed, in poor condition. *Cobb:* Those that have not been sheltered and well fed in very poor condition. The winter unusually cold and wet. *McDuffee:* Worse than for the last ten years. The oldest inhabitants say they never saw the cattle so poor and weak as they are now, and two-tenths will be sure to die this month. One farmer told me he had lost twenty-four out of forty head. We have had so much cold, snow, sleet, and rain that our cattle have died from the effects of the same. Our people do not prepare shelter for their cattle. The winters continue to get colder, and the cattle die out. We shall soon have to keep them better housed, or look to the West for our beef in summer and fall. *Heard:* Very poor for want of food and attention. *Pulaski:* Better than for the last ten years. *Oglethorpe:* Better than common where housed. *Jefferson:* Worse than for several years, owing to the unusually severe winter, a general want of shelter. and a general scarcity of food. *Brooks:* Better than common, owing to the dry winter.

FLORIDA.—*Gadsden:* Unusually reduced, owing to the severity of the winter and the want of proper sheltering. *Lery:* Good in some parts. The dry weather of the past fall and winter improved the low range, but on the high woods and along the rivers, where the swamps were overflowed in 1871, a great many have died. *Madison:* Fair, considering that no "winter quarters" are provided, and they are generally left to shift for themselves. *Liberty:* Better than for ten years. *Suwannee:* Good; some about fat enough for beef. *Wakulla:* Good; many of the dry cattle now fit for beef.

ALABAMA.—*Lauderdale:* Very bad. Very few provide cover for cattle, and the last winter being very severe, they suffered, and many died. *Barbour:* Poor; no "winter-quarters." *Wilcox:* Very bad; spring backward, and no provision for feeding, and so they are dying from emaciation in large numbers. *Marshall:* More poor cattle than I ever saw before. The tanners have bought a large number of "poverty hides."

MISSISSIPPI.—*Attala:* Never worse; bad winter and lack of feed. *Kemper:* Looking badly; no winter-quarters, and the winter unusually severe and protracted. *Tishemingo:* Weak for the want of food and shelter. *Madison:* Bad; the severest weather within the memory of "the oldest inhabitant." *La Fayette:* Average; the open woods and fields their only winter-quarters. *Jones:* Those fed during the winter in good condition, those not fed in bad.

LOUISIANA.—*Avoyelles:* Excellent, although last summer, autumn, and winter the most protracted and severe drought ever known prevailed here. The winter was one of the coldest on record, nevertheless the cattle have come out of the swamps in unusually good condition. Few, if any, perished. *Iberia:* Very poor; never winter-fed. *Carroll:* Very bad, owing to the extremely cold winter; no weather-sheds, and in many cases nothing to eat when the ground is covered with snow. Some feed cotton-seed; in such cases there has been little or no loss. *Richland:* Many have died from exposure and insufficient food. *West Feliciana:* Poor and bad; no attention paid to feeding in winter. *East Feliciana:* Better than usual; run at large in winter. *La Fourche:* Better than last year, owing to the dry winter.

TEXAS.—*Barnet:* Very bad, owing to severity of the winter and scarcity of food. *Red River:* Very poor; many have died. *Austin:* Worse than since 1860. Loss very heavy. *Fort Bend:* A large number of the cattle, which are never fed here in winter, have died from cold and hunger. *Collin:* Poor. Have to depend on the range. Many have died. *Navarro:* Very bad, owing to the continued drought in summer and fall, cutting off the supply of grass, followed by an extremely cold and wet winter. *Bandera:* A severe, cold storm of sleet in the latter part of January killed an immense number of cattle. *Atoscosa:* Minus at least one-third, and what are left are quite feeble. *Fayette:* Very poor and weak; winter very severe, and where they had to depend on the range alone for food, a great many died. *Upshur:* Good; farmers were better prepared to feed their stock than usual. *Williamson:* Wintered well; grass now good; stock improving very fast. *Kaufman:* Poor; fully 50 per cent. have died this winter from the extreme severity of the weather and lack of grass to keep stock in living order, the range having given out. The mortality has been greater with stock-cows and one and two year old cattle. *Coryell:* Thin. The main cause is what we call "the heel-fly," which is an insect about the size of the common gad-fly, but has a long tail like the bat-fly. On warm days in February and until the latter end of March it troubles our cattle very much. It makes them perfectly frantic. They will dash over the high bluffs or anything that comes in their way. They cannot feed, and their only relief is to stand in water. The fly seems to only trouble them about the feet. The result is that a great many die every spring for the want of sufficient time to graze. *Lavaca:* Winter-quarters for cattle and sheep are not known in this county; everything in that line is left to shift for itself. If they survive, well and good; if not, their owners go and skin them and sell the hide for nearly as much as the animal would bring alive at present prices here. Thousands almost have died during this winter, which was very severe, and those which weathered it through are very poor yet, but improving, as our grass on

the prairies is already quite good. *Titus:* Rather bad; not housed; seldom fed. *Cooke:* Very bad; the range having been burned off in every portion of the county.

ARKANSAS.—*Jefferson:* Those that have been sheltered and well fed look well; those that have not, very bad. *Montgomery:* Very poor. The excessively cold and hard winter has told fearfully on cattle that depended on the range. Many cows and some yearlings have died in March. *Independence:* Most miserable. Corn has not been so scarce at any time since the war. Hundreds of cattle and hogs were early in winter turned out to live in the woods, or to die of starvation, and fully 10 per cent. of the cattle and hogs of the county have perished in the long and severe winter. *Perry:* Worse than for twenty years. The exceeding long, cold winter has resulted in a loss of, say, one-fourth of the stock-cattle. *Izard:* Poor, for the want of food and shelter. *Madison:* Better than usual.

TENNESSEE.—*Robertson:* Look bad; very few of our farmers shelter their stock. *Loudon:* Bad as I ever knew them, in consequence of our long, severe winter, cold rains, and want of shelter. *Hamilton:* Thin; winter very severe on them; very few being housed. *Gibson:* Better than usual; less exposed to sudden changes, drizzling rains, &c. *Dyer:* Have stood the winter well; as a general thing have been well fed. *Hickman:* Better than last year; our county had about 250,000 bushels of pea-nuts and plenty of hay from them, which was fed freely; it is the most nutritious hay we raise, particularly for cattle. *Wayne:* Above average; have been better cared for than usual. *Grundy:* Look exceedingly well.

WEST VIRGINIA.—*Jefferson:* Thinner than usual; short pasturage last year; put into winter-quarters rather early; an unusually severe and protracted winter and a scanty supply of forage accounts for the thin condition. *Pleasants:* Stock owned by small farmers went into winter-quarters very thin and have not improved on half rations with exposure to extreme cold; owing to the low price of corn, the majority of large farmers have fed it to their cattle very liberally, and, consequently, they are in better condition than usual. *Boone:* Generally poor; farmers have fed longer and closer than for many years; feed is now scarce, and some cattle are dying from want.

KENTUCKY.—*Trimble:* Look badly, owing to the severe winter and want of shelter. Those which have been sheltered and provided for look exceedingly well. *McLean:* Better than usual; better cared for. *Oldham:* Below average. Have done well where well cared for. *Ohio:* Below average. Exceedingly cold, hard winter, winding up with scarcity of feed.

MISSOURI.—*Linn:* Average; the winter long and hard, but dry and unchangeable, and feed abundant and cheap. *Pemiscot:* Not quite average, except those that have been stabled and regularly watered. *Washington:* Average; winter very hard on those having no shelter. *Ralls:* Better than for many years past. *Worth:* Fair, but with less flesh than when they went into winter-quarters; which is to be expected from the kind of quarters provided, which, in most cases, is a straw-stack, a stalk-field, or such shelter as they are able to find in some fence-corner. However, a few of our farmers provide open sheds, covered with prairie-hay, closed up on the north, east, and west, and left open on the south. *Nodaway:* Strong, but thinner than usual. An unusual number of calves and lambs have frozen to death in dropping.

ILLINOIS.—*De Kalb:* Good; the weather has not been changeable, though intensely cold. When corn is from 15 to 20 cents per bushel cattle always winter well. *Cook:* Good, owing to the large corn-crop. *Winnebago:* Average; the winter has been very severe and springs low. A few herds have suffered for want of water. Corn has been abundant and cheap, and in all cases where water has been convenient, cattle are in good condition. *Franklin:* Better than usual; received much better attention.

INDIANA.—*Wells:* Good; more grain fed than usual. *Harrison:* Thinner than usual; light hay-crop, and unusually long and cold winter. *Lake:* Splendid; the most favorable winter for stock for a long time. *Ripley:* Pretty fair. The farmers generally provide good shelter for their stock, which goes far in rendering stock in good condition in spring, besides a saving of one-third in food.

OHIO.—*Champaign:* Good; severe and protracted cold, but little rain. *Medina:* Generally pretty good; many thin from scrimping.

MICHIGAN.—*Tuscola:* Much better than usual. *Shiawassee:* Good; never better. *Kalamazoo:* Rather lean and debilitated.

WISCONSIN.—*Iowa:* Never better. *Pierce:* Excellent. *Jackson:* Never looked better, where well housed and fed; where not well taken care of, looked badly. *Fond du Lac:* Quite well where properly cared for; some lost for want of shelter and food. *Green Lake:* Thin, and will be more so, for hay is becoming scarce.

MINNESOTA.—*Washington:* Good; better than average; from its being a severe winter they have received extra good care. *Dodge:* Thinner in flesh than usual, owing to the unusually cold and long winter; a few have died from poor shelter and scant feed, but the greater portion will come out in fair condition. *Scott:* Good, except in some cases of insufficient food.

IOWA.—*Dubuque:* Looking well. The most severe winter for eighteen years; the good condition is attributable to the fact that most of our farmers have good stabling for

heir cattle. *Muscatine:* Not as good as usual, owing to the exceedingly cold winter and, in many places, scarcity of water. *Johnson:* Fair; winter severe, but grain and hay abundant and cheap and stock have been well fed. *Jasper:* Never so good; corn cheap and plenty. *Lee:* Looking worse than usual; scarcity of rough feed. *Shelby:* Not so good as usual; an unusual number have died in dropping their calves.

KANSAS.—*Cherokee:* Excellent, owing to the abundant crops. *Johnson:* Thin; poor shelter, and extreme cold weather. *Labette:* Better than ever known in this county. The past winter said to be the hardest ever known in Southern Kansas—thermometer down to 18° below zero—but such bountiful crops were raised the past season, besides a great amount of prairie-hay cut, that cattle have had all the feed they could eat; besides, farmers have had better shelter for their stock, which is the biggest half in their feeding. *Lincoln:* All have done well except a drove of 500 from Michigan, which arrived here late in October in very poor condition, and lost 102.

NEBRASKA.—*Richardson:* Rather poor; hard winter. *Pawnee:* Never known to be better. *L'Eau qui Court:* Fair. Some farmers do not feed till their stock get poor; those have the most losses.

CALIFORNIA.—*Sonoma:* With rare exceptions neither cattle nor sheep are put into "winter-quarters." They have no other shelter than that afforded by nature. During seven years' residence in this county we have not known a winter so favorable as the past to stock. The long, cold rains, so injurious to stock in poor condition, have not prevailed: have had no severe storms. The rains have been mild and warm, and alternated with warm sunshine, so that grass has grown well, and the stock are in a thriving condition. *Napa:* Unusually good. Our beef has been superior to that of any former winter for many years. Stock-cattle have kept good on mountain and river pasture; no food given; no shelter. *Contra Costa:* Excellent. Sold a lot of beeves on the last day of February fully as fat as the best stall-fed. *Del Norte:* Better than usual; winter the warmest since 1863. *Mendocino:* Better than ever before; now fattening on the new grass. *Stanislaus:* Poor, from the want of proper care and food. *San Diego:* Suffered and 3 per cent. died for want of pasture, owing to drought.

OREGON.—*Umatilla:* Fine, without being fed—running on the pasture that nature has furnished. This county being a common meadow, and the winter being mild, we seldom have to feed any. *Douglas:* Splendid. *Yam Hill:* Excellent; much better than usual. *Grant:* Good; many of them good beef.

NEVADA.—*Esmeralda:* Very good; favorable winter.

COLORADO.—Fine; all above average. *Conejos:* Good; they run at large, and are never fed. *El Paso:* All right; fat beyond conception in the East. Have seen the heart of a yearling so completely enveloped with fat that the heart itself could not be seen. Steers, four years old, slaughtered off the range, net 1,400 to 1,800 pounds.

DAKOTA.—*Minnehaha:* Fine; the weather cold, but equable.

UTAH.—*Sevier:* Good as usual; the winter very mild. *Tooele:* Very poor; owing to heavy storms in February, many died on the range. *San Pete:* Very poor. The snow has fallen to an unusual depth, covering up all feed, and cattle have had to be put in yards and fed on chaff, straw, &c. *Rich:* Excellent. *Salt Lake:* Good.

MONTANA.—*Missoula:* Better than usual; more hay, and less shifting for themselves. *Lewis and Clarke:* Much better than previous winter; open and mild winter.

IDAHO.—*Ada:* Excellent; in most instances have improved during the winter, and plenty of good beef is coming from the ranges.

NEW MEXICO.—*Santa Fé:* Fair.

WASHINGTON.—*King:* Good; very mild winter; no snow, and very little cold weather.

CONDITION OF SHEEP.

The comparatively dry winter and the general cheapness and abundance of feed have combined, with the advanced price of wool, not only to exempt sheep from exposure, want, and disease, but to keep them in a condition of unusual health and thrift. One correspondent emphasizes the remark that "*wool will not grow on poor and poorly fed sheep;* our wool-growers have learned this, and are practicing the more profitable method of early and continuous feeding." Another observes: "Long experience has convinced me that little or no disease ever troubles a lot of *fat* sheep." The principal exceptions to the generally favorable condition of sheep through the past winter are found in the Gulf States, North Carolina, Tennessee, Kentucky, and West Virginia. The reasons for these exceptions will be apparent in the extracts from correspondents which follow. Out of 915 counties reporting with such a degree of definiteness as to give some clew to their relative condition,

520 are returned as above average, 235 as average, and 160 as below average. Out of 40 returns from New England 33 range above average and only 2 below—namely, Franklin, Maine, and Cheshire, New Hampshire; in the latter the condition is reported "not good, owing to poor hay from wet weather." Grafton, the same State, returns "first rate," and Hillsborough, "never better." The report from Orange, Vermont, "looking well, no sudden changes, winter cold and dry," is a specimen for the State. Bristol, Massachusetts, returns "25 per cent. above average;" Kent, "extra good;" New London, Connecticut, "much better than ordinary." The relative condition in the other States and the Territories will be evident from the following table of condition in counties and from the extracts beneath. As in the table for cattle, counties in which the returns were not sufficiently definite to admit of classification are omitted:

States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.	States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.
Maine	10	9	1	.....	West Virginia	29	8	10	1
New Hampshire	6	5	.....	1	Kentucky	41	15	12	14
Vermont	19	8	1	1	Missouri	51	30	13	8
Massachusetts	7	5	2	.....	Illinois	49	36	11	2
Rhode Island	2	2	.....	.....	Indiana	51	35	10	6
Connecticut	5	4	1	.....	Ohio	42	28	10	4
New York	34	17	13	4	Michigan	26	18	6	2
New Jersey	11	11	.....	.....	Wisconsin	29	23	4	6
Pennsylvania	33	23	9	1	Minnesota	30	19	7	4
Delaware	1	.....	.....	1	Iowa	51	40	10	1
Maryland	9	2	5	2	Kansas	17	17	.....	....
Virginia	57	26	22	9	Nebraska	10	7	3	....
North Carolina	44	15	17	12	California	17	14	1	2
South Carolina	7	2	2	3	Oregon	6	6	.....	....
Georgia	34	14	9	11	Nevada	1	1	.....	....
Florida	11	5	5	1	Colorado Territory	5	5	.....	....
Alabama	22	9	9	6	Dakota Territory	4	3	1	....
Mississippi	22	8	6	8	Montana Territory	2	2	.....	....
Louisiana	13	7	1	5	Washington Territory	1	1	.....	....
Texas	44	17	13	14	Utah Territory	9	3	2	4
Arkansas	18	6	9	3	New Mexico Territory	1	.....	1	....
Tennessee	38	12	9	17	Idaho Territory	1	1	.....	....

NEW YORK.—*Chemung:* Good; less hay and more grain. *Washington:* Thin; light fleeces; long, hard winter.

NEW JERSEY.—*Warren:* Look better than for many years.

PENNSYLVANIA.—*Cumberland:* Better than for many years. *Bucks:* Very good; less hay and more grain. *Indiana:* Have done well. The yield of lambs is wonderful, but a hard spring for raising them. *Union:* Poor.

DELAWARE.—*Sussex:* Ten per cent. below average.

MARYLAND.—*Queen Anne:* Looking very well; specially cared for.

VIRGINIA.—*Madison:* Good; the result of increased attention. *Grayson:* Have wintered better than usual, owing to considerable progress in the improvement of breeds; there is a marked contrast between the improvement of flocks now and one or two years ago. *Fauquier:* Have suffered more than other stock, but where properly sheltered and cared for but few losses. *Botetourt:* Have been injured by the dreadful cold. *Greenville:* Good; with a run on pasture all winter.

NORTH CAROLINA.—*Tyrrel:* Strong and healthy. *Chowan:* Bad, owing to the extreme cold and wet winter.

SOUTH CAROLINA.—*Lexington:* Rather poor; where properly sheltered and fed they look well.

GEORGIA.—*Wilkes:* Better than usual because better cared for. *Dooly:* Splendid; never known to be better. *Laurens:* Reduced; winter unprecedentedly cold. *Cobb:* Have suffered for food and shelter. *White:* Poor; cold, wet, and no shelter. *Liberty;* All not killed by dogs remarkably good. *Milton:* Average, what few the dogs have left. *Jackson:* All killed by dogs. *Oglethorpe:* My flock is small, but they are healthy and fat. I do not lose any, but take the precaution to shoot every dog I find among them. After notice of this I hardly ever see a dog, that the owner cares anything

about, in their pasture. *McDuffee:* Very bad; a great many of the sheep are unable to raise their young, from the fact that they are too poor to give nourishment enough to sustain life. We have lost twice as many as in any previous winter within my recollection.

FLORIDA.—*Gadsden:* Better than cattle, more attention being paid to feeding and sheltering them. *Jackson:* Average; long, severe winter, but dryer than usual. *Liberty:* Better than for ten years.

ALABAMA.—*Limestone:* Very poor; winter the severest ever known. About one-third of the early lambs died. *Butler:* Average; never go into winter-quarters. *Marshall:* Good; subsist through the winter without feed.

MISSISSIPPI.—*Jones:* Those attended to very good. *Attala:* Never worse, owing to bad winter and lack of feed.

LOUISIANA.—*Tensas:* Good; will take care of themselves all winter and get fat. *Morehouse:* Bad; a large majority of the lambs have died. *West Feliciana:* Poor and bad; no attention paid to feeding in winter. *East Feliciana:* Good, so far as cared for. *Richland:* Many have died from exposure and insufficient food.

TEXAS.—*Barnet:* Lean; those fed with corn on stormy days looking somewhat better. *Rusk:* Very good, as they are very fond of cotton-seed, which appears to agree with them. *Medina:* Suffered less than cattle, as very short grass and even weeds will sustain them. *Navarro:* Better than cattle, but not more than half the lambs have been saved. *Williamson:* Poor, owing to the scab; much of the wool shed. *Kendall:* Thin, as no winter-quarters are provided.

ARKANSAS.—*Independence:* Better cared for than other stock, and though looking badly but few have been allowed to perish. *Jefferson:* Have done well without shelter—much better than cattle. *Izard:* Poor, for want of food and shelter.

TENNESSEE.—*Sumner:* Better than usual, owing to better attention. *Gibson:* Well, thrifty, and strong; less than usual of thawing and freezing, and of cold drizzling rains. *Wayne:* Above average; better cared for than usual. *Robertson:* Low; dry fall, long winter, and without shelter or grain-food. *Bedford:* Looking badly; many have died where flocks are large. *Granger:* Have not come out, for the reason that we raise dogs and not sheep.

WEST VIRGINIA.—*Upshur:* Average; those that were grained look remarkably well. *Fayette:* Look bad; a long severe winter with a good deal of snow and rain has made it very hard on sheep. *Boone:* Not as good as usual; great loss of lambs. *Marshall:* Worse than for many years. *Hancock:* Very good.

KENTUCKY.—*Trimble:* The well provided for and sheltered look well; those not sheltered and cared for are poor. *Nicholas:* Better than cattle, owing to the fact that there has not been much rain. *Rockcastle:* Rather bad; severe winter and not much shelter. *Carroll:* Below average; have required more care and food than usual, owing to the sleet that covered the grass entirely for several weeks. Generally, in this county, the sheep live on the blue grass the whole winter without other food. *Graves:* Doing well, what have escaped the dogs; four dogs to one sheep.

MISSOURI.—*Adair:* Better than usual. Farmers are taking better care of their sheep than heretofore. *Shelby:* Doing well; winter cold but dry. *Pemiscot:* Average; the few we keep have been housed. *Lawrence:* Poor; too cold for them without shelter. *Vernon:* Poor and very ragged, owing to the scab.

ILLINOIS.—*Grundy:* Better than average, on account of the plenty and cheapness of corn and oats, and the value of wool. *DeKalb:* Have wintered well; better provided with winter-quarters than formerly. *Franklin:* Better than usual; dry weather and good care. *Pike:* Good; abundant corn crop.

INDIANA.—*Carroll:* Good, where their quarters were good. *Scott:* Better than usual; better cared for. *Wayne:* Looking well; have unusual attention when the price is high. *Warrick:* Good; received more than ordinary attention. *Morgan:* Ten per cent. below average; the winter extremely severe, the hardest I have seen in forty-six years. *Carroll:* Good, where their quarters were good.

OHIO.—*Logan:* Generally good; cases of neglect of care and feeding the exceptions. *Champaign:* Average; where properly fed, above; cold dry weather does not affect well-fed sheep unfavorably. *Hardin:* Quite a loss of old and feeble sheep and of lambs. *Loraine:* Fine, where well attended to.

MICHIGAN.—*Branch:* Never better. *Lapeer:* Fifteen per cent. above average. *Montcalm:* Hardly average; snow fell about the 1st of December, ground covered ever since, and weather extremely cold.

WISCONSIN.—*Outagamie:* Look finely; always do well when wool brings a good price. *Monroe:* Good, except where scab prevailed. *Fond du Lac:* Some loss for want of care and shelter. *Walworth:* Fair to good. The clear dry atmosphere has been conducive to full health and good appetite. Sheep have done unusually well; have consumed much coarse feed, and promise a good clip of wool and crop of lambs.

MINNESOTA.—*Carver:* Never better; winter cold, but dry. *Sibley:* Not good; the farmers are not yet prepared with sufficient barns.

IOWA.—*Polk:* Looking well. Long experience has convinced me that little or no

disease ever troubles a lot of *fat* sheep. *Tama:* Good. Corn abundant. *Cherokee:* Above average; better care. *Guthrie:* Above average. Cheap corn.

KANSAS.—All above average. *Labette:* Better than ever known in this county. *Woodson:* Much better than usual. *Wool will not grow on poor and poorly fed sheep.* Our wool-growers have learned this, and are practicing the more profitable method of early and continuous feeding.

NEBRASKA.—*Madison:* Plenty good enough for mutton.

CALIFORNIA.—*Alameda:* Good. The increase of lambs will be 80 per cent. throughout the State. *Mendocino:* Better than ever before. *Del Norte:* Have no winter-quarters; run in the open field and are fat. *Stanislaus:* Poor, from want of food and shelter from the cold winds and storms. *San Diego:* Suffered, and 20 to 25 per cent. of all flocks died for want of pasture. No rains to do any good until February, there having been a drought for the last three years. *Plumas:* Of 30,000 sheep in this county in the summer, not more than 1,000 are wintered here, the rest being driven to the lower valleys for winter-grazing.

OREGON.—*Yam Hill:* Excellent; much better than usual. *Umatilla:* Fine; have passed the winter without feed.

NEVADA.—*Esmeralda:* Very good.

COLORADO.—*Conejos:* Good; herded, but never fed.

DAKOTA.—*Minnehaha:* Fine. Cold, but equable winter.

UTAH.—*Sevier:* Excellent. Pasturage excellent. *Tooele:* Poor and scabby.

IDAHO.—*Ada:* Better than average.

MONTANA.—*Lewis and Clarke:* Much better than usual. Winter open and mild. *Missoula:* Good.

NEW MEXICO.—*Santa Fé:* Fair.

WASHINGTON.—*King:* Good.

LOSSES OF CATTLE AND SHEEP.

In the following table, counties reporting "no loss," without referring to the previous winter, are placed under the head "less;" under the head "average" are placed all reported as "average," or in terms equivalent, whether with or without reference to the previous winter.

States and Territories.	No. of counties reported.	Less.	Average.	Greater.	States and Territories.	No. of counties reported.	Less.	Average.	Greater.
Maine	10	10	0	0	West Virginia	29	10	12	7
New Hampshire	7	5	2	0	Kentucky	39	12	22	5
Vermont	10	5	3	2	Missouri	53	27	23	3
Massachusetts	6	6	0	0	Illinois	48	25	19	4
Rhode Island	2	2	0	0	Indiana	51	24	23	4
Connecticut	7	4	3	0	Ohio	43	17	19	7
New York	36	17	17	2	Michigan	27	17	8	2
New Jersey	13	7	6	0	Wisconsin	29	16	11	2
Pennsylvania	40	29	10	1	Minnesota	30	11	6	13
Delaware	1	0	1	0	Iowa	58	32	19	7
Maryland	11	7	1	3	Kansas	32	28	2	2
Virginia	61	32	18	11	Nebraska	11	7	3	1
North Carolina	45	25	14	6	California	20	13	7	0
South Carolina	10	5	2	3	Oregon	6	5	1	0
Georgia	47	23	13	11	Nevada	1	1	0	0
Florida	15	9	3	3	Colorado Territory	5	0	0	0
Alabama	20	4	9	7	Idaho Territory	1	1	0	0
Mississippi	28	10	10	8	Dakota Territory	5	4	1	0
Louisiana	14	7	0	7	Montana Territory	2	2	0	0
Texas	51	8	10	33	Washington Territory	1	1	0	0
Arkansas	20	9	3	8	Utah Territory	9	3	2	4
Tennessee	40	16	12	12	New Mexico Territory	1	1	0	0

Of the above 995 counties, 178 return a loss greater than in the previous winter; 315 average, and 502 less. Grand Isle and Addison Counties in Vermont are the only ones out of 42 in New England which return a greater loss. The former reports: "No loss of cattle; loss of sheep double." The latter: "Loss of cattle, average; of sheep, double." In Pennsylvania, Indiana County reports: "Less loss than

for the last ten years." *Warren:* "Our farmers are learning that it pays to feed and care for their cattle and sheep, and that it does *not* pay to get their stock nearly or quite through the winter, and then let them die." *Tioga:* Thirty per cent. less. In Cecil, Maryland, "more lambs have died, owing to the unusually severe weather."

VIRGINIA.—*Louisa:* Greater by 25 per cent. *Frederick:* In sheep, five times greater; in cattle, no greater. *James City:* Not one-fourth as great. *Northampton:* Fifteen per cent. less. *Nansemond:* Twenty per cent. greater. *Buckingham:* Less than for many years. *Clarke:* Little loss in cattle; loss of sheep much greater, fully five to one. *Henry:* Less by one-half. *Page:* Fifty per cent. less.

NORTH CAROLINA.—*Cumberland:* Less by 50 per cent. *Moore:* One-tenth of what it was last year. *Chowan:* Twenty per cent. greater. *Cherokee:* Of cattle, about double: of sheep, average. *Stanly:* Less than for several years. *Iadkin:* Less than usual: winter-feed more plenty.

GEORGIA.—*Jackson:* Very few losses of cattle; sheep all dead from dogs. *Brooks:* Ninety per cent. less than usual. *Murray:* Of cattle, 10 per cent. less; of sheep, 20 per cent. less. *McDuffee:* Twice as great. *Pulaski:* Twenty per cent. less. *Johnson:* Fifteen per cent. less. *Heard:* Twenty per cent. greater. *White, Laurens,* and *Butler:* Ten per cent. greater.

FLORIDA.—*Madison:* Average; winter more severe than the previous, but farmers are becoming more careful of their cattle. *Hamilton:* Ninety per cent. less. *Clay:* Thirty per cent. less. *Suwannee:* No loss; 35 per cent. less. *Wakulla:* Twenty per cent. less.

ALABAMA.—*Lauderdale:* Nearly double. *Blount:* Twenty-five per cent. greater. *Marshall:* Of cattle, 450 per cent. greater; of sheep, average.

MISSISSIPPI.—*Lowndes:* Losses heavy, owing to scarcity of hay and cold weather. *Wilkinson:* Of cattle, five times as great; of sheep, about the same. *Rankin:* Twenty-five per cent. greater. *Madison:* Twenty per cent. greater. *Newton:* Less by 50 per cent. *Wayne:* Fifty per cent. less. *Kemper:* Average; more attention given them.

LOUISIANA.—*Morehouse:* Twenty-five per cent. greater. *Richland:* Twenty per cent. greater. *Franklin:* Of cattle, five times as great; of sheep, two and a half times. *Tangipahoa:* Of cattle, 15 per cent. greater: of sheep, 25 per cent. greater. *Cameron, Avoyelles,* and *Saint Mary's:* No losses. *West Feliciana:* No losses except the old or very young.

TEXAS.—*Cherokee:* Of cattle, 10 per cent. less; of sheep, 50 per cent. greater. *Burnet:* Of cattle, 35 per cent. greater; of sheep, average. *Collin:* Fifty per cent. greater. *Fort Bend:* Twenty per cent. greater. *Grimes:* Thirty-three per cent. above average. *Bandera:* Loss of cattle immense; no serious loss of sheep. *Smith:* Twenty-five per cent. greater. *Atascosa:* Of cattle, about one-third this winter; scarcely any last; of sheep, about average. *Fayette:* Of cattle, by starvation, about one-third greater. *Laraca:* One hundred per cent. greater. *Cooke:* Of cattle, ten to one; of sheep, average. *Montgomery:* Of cattle, twenty per cent. greater: of sheep, none. *Blanco:* Three or four times as great as common. *Palo Pinto:* Seventy-five per cent. less. *Comal:* Of cattle, much greater; of sheep, less. *Gonzales:* Of sheep, decidedly less; of cattle, at least 100 per cent. more. In fact, such has been the destruction of cattle by the severity of the past winter that the business of stock-raising on the old ranchero system may almost be considered a thing of the past. It is not by any means extravagant to set down the loss of cattle in Gonzales County at 20,000 head. This great loss is to be accounted for by the fact that the county has been overstocked until the grass has been destroyed, or at least so reduced as to be too short to support the cattle. This immense loss has induced many to drive even their stock-cattle in search of a market, so that the decrease of cattle from death and sale may safely be put down at 75 per cent. *Hunt:* Loss of cattle at least 30 per cent. greater than the previous year, owing to the unusual severity of the winter, added to the fact that, by reason of the drought of last year, they did not go into winter-quarters in as good condition as usual. The losses in sheep of the ordinary breeds are too slight to be estimated; the losses in the better breeds are much heavier. The latter require more attention in wintering. *Bosque:* Much greater than ever known in this county. From the best information I can get, at least one-half of all the stock-cattle have died; not from any disease, but for want of water and grass. They are in many places still suffering for water; the drought has continued so long that it has all dried up in the small tributaries, and in many places the cattle are compelled to feed five to six miles from water, all the grass having been eaten within that distance. *Dallas:* Of cattle, at least 25 per cent. greater than it ever has been.

ARKANSAS.—*Madison:* Less by 50 per cent. *Sharp:* Much less. *Hot Spring:* Heavier than for the last ten years. *Perry:* Of cattle, three to one; of sheep, average. *Montgomery:* At least three times as large. *Independence:* Ten per cent. of the cattle and hogs have perished, (for want of food and shelter.)

TENNESSEE.—*Maury:* Much greater than any winter since 1865. Half the lambs dropped at this time have died, and 75 per cent. of the ewes have lambed. *Williamson:* Ten to one. *Sumner:* Of cattle, average; of sheep, double; one-third of the lambs have died. *Macon:* Of cattle, average; of sheep, twice as great. *Roane* and *Fayette:* No losses. *Fentress:* Losses trifling. *Wayne:* Fifty per cent. less. *Monroe:* Less—very small. *Henry:* Of cattle, average; of sheep, 70 per cent.—killed by dogs.

WEST VIRGINIA.—*Morgan:* Fifty per cent. greater. *Mercer:* Of cattle, 40 per cent. less; of sheep, 20 per cent. less. *Jefferson:* Of cattle, 10 per cent. greater; of sheep, 12 per cent. greater. *Harrison:* Of cattle, average; of sheep, double. *Pleasants:* No losses this year or last.

KENTUCKY.—*Anderson:* 75 per cent. greater. *Grayson:* 90 per cent. less. *Magoffin:* 15 per cent. less. *Groves:* 5 per cent. less; the winter the coldest for twenty years, but dry. *Larue:* Of sheep three times as great.

MISSOURI.—*Marion:* Less; feed abundant, and dry winter. *Ballinger:* 50 per cent. less. *Shelby:* Less than for many years. *Linn:* 20 per cent. less, owing to the great abundance of all kinds of feed. *Pemiscot:* Of cattle, average; of sheep, less, because of the dry winter. *Vernon:* 5 per cent. greater, partly owing to excessive cold and want of water. *Carter:* No losses. *Phelps* and *Pulaski:* 25 per cent. greater. *Greene:* 25 per cent. less.

ILLINOIS.—*De Kalb:* Less than ever known. *Bureau:* 50 per cent. less. *Hancock:* Less, owing to the dry weather. *Putnam:* Less than for many winters past. *Moultrie:* Less than in any winter for ten years. *Monroe, De Witt,* and *Schuyler:* No losses. *Carroll:* Greater than usual; have suffered for water. *Kankakee:* 25 per cent. greater. *Lawrence:* 33 per cent. greater. *Macon:* 33 per cent. less.

INDIANA.—*Warren:* Less than in former years. *Ripley:* Less than in any previous year known.

OHIO.—*Vinton:* 20 per cent. less. *Adams:* 25 per cent. less. *Lorain:* Never less. *Noble:* Not so great as in other years. *Carroll:* 30 per cent. greater. *Fayette:* 20 per cent. greater.

MICHIGAN.—*Calhoun:* Less than in more open winters. *Saint Clair:* 50 per cent. less. *Montcalm:* Of cattle, very few; more sheep than in any winter within five years; think it is because they could not get to the ground.

WISCONSIN.—*Walworth:* Of cattle, 50 per cent. less; of sheep, 100 per cent. less. *Douglas, Washington, Green, Marathon,* and *Outagamie:* No losses. *Brown:* 10 per cent. greater.

MINNESOTA.—*Waseca:* More than double. *Dodge* and *Freeborn:* 100 per cent. greater. *Nicollet:* A little greater, owing to the storm of January 7. *Martin:* Of cattle, average; about one-tenth of the sheep were smothered in the great storm in January. *Watonwan:* A slight loss by the great storm of January 7. *Isanti:* 10 per cent. greater, owing to hard storms. *Brown:* Four times as many as in previous winters lost in the snow-storm. *McLeod:* Less than average, except the few that perished in the storm of January 7 and 8. *Carver:* 90 per cent. less. *Steele:* Hardly a case of loss in either.

IOWA.—*Buchanan:* Greater, owing to extreme cold, severe storms, and want of shelter; where well sheltered I hear of no loss. *Bucna Vista:* A large number of cattle have been lost by being caught in corn-fields in hard storms. *Marion:* 75 per cent. less. *Floyd:* Of cattle, more, as some were buried in the snow. *Howard:* Of cattle, greater; quite a number perished in the great storm of January. *Jasper:* 20 per cent. less. *Harrison:* Almost no loss. *Audubon, Lee, Appanoose, Dallas,* and *Jackson:* No losses. *Allamakee:* 20 per cent. greater.

KANSAS.—*McPherson:* Losses, 25 per cent. last year, 2 per cent. this. *Nemeha:* No loss, better feed, better shelter, and better care the reasons. *Riley:* Less than usual; corn low, and more of it fed. *Linn:* 50 per cent. less. *Lincoln:* Last winter 33 per cent. of the cattle died and about 3 per cent. of the sheep; this year no cattle, and not half of one per cent. of sheep. *Jefferson:* 50 per cent. less. *Labette:* 60 per cent. less. *Marion:* Not 1 to 10 of last winter. *Woodson:* Of cattle, 60 per cent. less; of sheep, 40 per cent. less; early dropped lambs (which ought to be avoided) constitute the principal loss of this spring. *Lyon:* 75 per cent. less. *Rice, Chase,* and *Dickinson:* 90 per cent. less. *Sawnee:* 50 per cent. greater, owing to the severe winter and to bad management.

NEBRASKA.—*Madison:* No losses except where caught in severe wind and snow-storms. *Cedar:* 90 per cent. less. *Otoe:* 100 per cent. greater.

CALIFORNIA.—*Sacramento:* Less than in any previous winter. *Los Angelos:* Less than for several years. *Mendocino:* 70 per cent. less. *Del Norte:* 75 per cent. less. *Sonoma:* 80 per cent. less. *Butte:* 50 per cent. less. *Placer* and *Almeda:* No losses. *Contra Costa:* No losses; range abundant and winter mild.

NEVADA.—*Esmeralda:* Very favorably.

OREGON.—*Grant:* 25 per cent. less; *Yam Hill:* 90 per cent. less.

COLORADO TERRITORY.—*Weld:* 95 per cent. less. *Conejos, Huerfano,* and *Douglas:* No losses.

DAKOTA.—*Lincoln:* No losses.

UTAH.—*Toodle:* 100 per cent. greater; all the early lambs died, also most of the oldest ewes; the cattle did not fare better; several made high wages by skinning dead cattle on the range. *San Pete* and *Davis:* 10 per cent. greater. *Weber:* Less. *Rich:* Very favorably; but few losses.

MONTANA.—*Lewis and Clarke:* No losses.

IDAHO.—*Ada:* Losses merely nominal.

WASHINGTON.—*King:* Hardly any loss.

NEW MEXICO.—*Santa Fé:* Little or no loss.

DISEASES OF FARM ANIMALS.

With the exception of the epizootic influenza, popularly known as the epizooty, which affected horses during the year past, farm animals of all kinds enjoyed a remarkable immunity from disease during 1872. The experience of former years was fruitful in many localities in the increased care and better provision for the wants of live stock, yet in many portions of our country much of this practical humanity is yet to be learned. A very large proportion of the few diseases of cattle, sheep, and hogs reported by our correspondents is attributed to lack of shelter, food, and cleanliness, while the loss of horses was considerably enhanced by neglect or ill-treatment, especially in compelling animals to perform labor while in a debilitated condition. Below will be found a brief generalization of the important facts in regard to each class of farm animals, as detailed by our correspondents.

DISEASES OF HORSES.

With the exception of the sudden and severe eruption of epizootic influenza, which swept across the Union during the last fall and winter, the last pulsations of which are now felt upon the Pacific coast, horses, during 1872, were remarkably exempt from disease. This prevailing malady, commonly called the epizooty, seems to have absorbed all ordinary horse ailments. A few counties rather dubiously report other diseases, but it is difficult to ascertain how far these were modifications or results of the epizooty. The latter, with its various developments, constitutes almost exclusively the record of horse diseases in the United States during 1872. It first attracted general notice, through the newspapers, about the last of September, and was represented as having invaded the United States from Canada, where it had prevailed for some time previous. Our reports, however, show an earlier date of attack at isolated points in this country. The earliest visitation—about the last of August—appears to have been in Mercer County, on the western border of Pennsylvania, the third county in southward succession from Lake Erie. It appeared a little later—September 1—in Hillsborough and Merrimack, two of the most southern counties of New Hampshire. Our correspondent in Forsythe, one of the mountainous counties of North Carolina, assigns September 5 as the date of its outbreak in that locality. About the middle of September it was noticed simultaneously in Cape May and Hunterdon Counties, New Jersey; Northampton and McKean Counties, Pennsylvania; Cecil and Talbot Counties on the eastern shore of Maryland; Madison, Greenville, Rappahannock and Prince George Counties, Virginia; Moultrie County, Illinois; Breckinridge County, Kentucky, and Mineral County, West Virginia. Cape May is the most southerly county in New Jersey; it is remarkable, in this connection, that the disease was not noticed in At-

lantic, the next county to the north, till December 1. Its general progress was southward and westward, yet not without some perplexing anomalies. In Ohio, for instance, it appeared about October 1; in Geauga, in the extreme northeast, and in Hamilton, in the extreme southwest, while in the majority of the counties of the State its advent is reported as late in November, and in one—Williams, in the extreme Northwest—so late as December 20. In the other States north of the Ohio River, its first symptoms were variously noted from the middle of October till Christmas. West of the Mississippi it appeared to radiate about equally in different directions. At our latest advices it had just appeared in Lewis and Clarke County, Montana, and in Ada County, Idaho; in both localities its introduction was charged upon overland stage companies. It appeared in El Paso County, Colorado, as early as December 1; but Conejos, Huerfano, Douglas, and Weld report its appearance in the earlier part of January. Still later it appeared in Santa Fé County, New Mexico, and in Sevier, Weber, Tooele, Rich, San Pete, Cache, and Davis Counties, Utah. Its presence was felt in Plumas County, California, as early as December 1; in Alameda, December 15; Santa Clara, January 31; San Joaquin, February 14; Alpine, March 5; Los Angelos, March 18. It was expected in other counties in California, Oregon, and Washington, but in the latter it had not appeared.

The average dates of the first appearance of the disease in each of the States were as follows: Maine, October 19; New Hampshire, October 20; Vermont, October 18; Massachusetts, November 7; Rhode Island, November 1; Connecticut, October 29; New York, October 19; New Jersey, October 20; Pennsylvania, October 24; Delaware, October 28; Maryland, October 22; Virginia, November 5; North Carolina, November 17; South Carolina, November 19; Georgia, November 23; Florida, November 17; Alabama, December 1; Mississippi, November 28; Louisiania, December 5; Texas, December 17; Arkansas, November 19; Tennessee, November 21; West Virginia, November 19; Kentucky, November 18; Ohio, November 9; Michigan, November 2; Indiana, November 19; Illinois, November 17; Wisconsin, November 15; Minnesota, December 3; Iowa, November 28; Missouri, December 7; Kansas, December 10; Nebraska, December 14.

The symptoms of the disease are detailed with remarkable uniformity in different parts of the country. It is everywhere described as a catarrhal influenza; in many places it so closely resembles the old fashioned "distemper" that, but for the special attention given to the subject, it would have been identified with it. That it is to some extent contagious seems scarcely to admit of doubt, but this character of the malady will by no means account for its regular and rapid extension over the country. It traveled in radial lines from its original points of development in the New England and Middle States, and within ten weeks was demonstrating its existence in Texas and California. Its local diffusion was accompanied by phenomena which cannot be accounted for upon the hypothesis of contagion. Its appearance at points in advance of its regular line of progress, and its simultaneous development in all parts of a county, argue the existence of some general conditions, some predisposing causes of disease, developing themselves in succession like waves across the continent. In New York City 40,000 horses were attacked within a week or ten days, and in all the cities, towns, and rural districts, the visitation was so sudden and so general as to paralyze all kinds of transportation which depended upon the use of horses. Occasionally horses would escape the disease, though confined in stables with infected

animals. On the other hand, animals kept from all possible contagion were affected as strongly as others.

The premonitory symptoms of the disease were, generally, a loss of appetite, apathetic dullness, prostration, drooping head and ears, a staring coat of hair, watery or glassy eyes, and a thin discharge of mucus from the nose. As the disease advanced these symptoms were intensified. The joints became stiff, and a peculiar cough, sometimes described as sharp and hacking, and sometimes as deep in the chest, seemed to rack the whole animal system. Muscular exertions would sometimes excite this cough to distressing paroxysms. Fever set in, and the blood circulated with abnormal activity in the head, neck, and body, while it almost deserted the ears and legs, leaving them unnaturally cold. The mouth was hot, and the nasal membranes, in some cases, were congested. The nasal discharge became more copious and offensive, varying in color from white to green, and often stained with blood. The animal obtained great relief from the free discharge of this purulent matter. The lungs and throat sympathized with the other organs, and showed signs of acute inflammation. The breath was labored and painful. In more severe cases the brain was affected, a symptom which generally indicated a fatal termination.

The average continuance of the disease in individual cases varied considerably, the extreme range being between five days and forty-five days, the minimum being in Franklin County, North Carolina. The averages were somewhat greater east of the Alleghany Mountains. In Maine, the county averages ranged from 10 to 25 days, the State average being 16. New Hampshire reports a longer continuance of the disease, the counties ranging from 21 to 42 days, and the State averaging 35. In the other New England States the period was shorter; Vermont averaging 20; Massachusetts, 20; Connecticut, 23. In the Middle States the county averages ranged from 9 to 42 days, the shortest period being reported in Cattaraugus, New York. The State of New York averaged 20 days; New Jersey, 25; Pennsylvania, 23. The Atlantic Coast States varied between five days (in Franklin County, North Carolina) and 42 days. The State averages were as follows: Maryland, 26 days; Virginia, 21; North Carolina, 21; South Carolina, 26; Georgia, 21. The Gulf States varied between 8 days and 42 days, the shorter period being reported in Lauderdale and Limestone Counties, Alabama. Florida averaged 19 days; Alabama, 20; Mississippi, 21; Louisiana, 22; Texas, 21. The inland Southern States ranged from 10 to 45 days, the minimum being in Pocahontas County, West Virginia, and the maximum in Davies County, Kentucky. Arkansas averaged 19 days; Tennessee, 21; West Virginia, 18; Kentucky, 20. North of the Ohio River the county averages ranged from 10 to 42 days. Ohio averaged 20 days; Michigan, 23; Indiana, 23; Illinois, 23; Wisconsin, 22. West of the Mississippi the disease prevailed from 10 to 35 days; Minnesota averaged 24 days; Iowa, 23; Missouri, 19; Kansas, 21; Nebraska, 22. The reports from the Territories were too few for a reliable average. In California one county, San Joaquin, averaged 12 days.

As a general thing the severity of the visitation in different localities may be estimated from the length of its continuance. This rule, however, is not without exceptions, and should be applied with due caution. The period was often unnecessarily lengthened by abuse, neglect, or hard work before final recovery. This ill treatment not only protracted the preliminary attack, but also brought on relapses, which terminated in dropsy, pneumonia, or other forms of acute disease, from which few

animals recovered, and those that did survive were generally of little value as work-animals subsequently.

The treatment of disordered animals was of the most varied description, from the most systematic quackery to utter neglect. It is difficult to decide from our reports which of these extremes was the more fatal. Some ambitious veterinary surgeons exhausted the resources of the materia medica in order to find a universal specific, and mercilessly administered nostrum after nostrum, to the great injury of the afflicted animal. Liverymen in towns and cities were especially addicted to elaborate treatment. The suddenness of the visitation, and the very serious impediment which it created in all kinds of industry and trade, begot an anxiety to expedite the processes of nature and to work a cure in the shortest possible time. This impatience caused the loss of a large number of valuable horses that might otherwise have entirely recovered from the disease; it was generally the more valuable animals that were subjected to this forcing treatment. In a large number of counties, in all parts of the Union, these facts are clearly and emphatically stated by our correspondents, who almost universally favor a milder and more sensible treatment. The application of embrocation to the skin in order to bring the internal inflammation to the surface and thus relieve the suffering organs, and the cleansing of the nostrils by dilutions of carbolic acid, &c., and stimulating the free discharge of mucus, were in many cases reported as very beneficial, but the unmitigated dosing practiced by many persons is strongly condemned. The elements of the most successful treatment appear to have been rest, extra care, good grooming, clean, warm, and well-ventilated stables, from which poisonous effluvia had been removed by lime, carbolic acid, or other disinfectants, a genial and yet laxative diet of scalded oats, warm bran mash, raw apples, and potatoes, &c., blankets and leg-bandages. In many cases gentle exercise or even moderate labor was reported as better than absolute rest, but this could have been true only in milder cases, and in the prior stages of the disease. In some portions of the country where the infliction was not severe, good shelter, with free range of dry pasture in good weather, was found better than blanketing and warm stables. In a few cases, animals entirely destitute of shelter, fared better than others kept under cover. Such, however, could not have been exposed to the cold winter rains so injurious to even healthy farm animals in most parts of the country. A case in point occurred near Richmond, Virginia; ten mules were employed in a coal-mine and had no communication with the upper air except through a shaft 600 feet deep. One of the mules commenced coughing on Saturday night, and by Tuesday all were affected with the epizooty. Two died, but the others were but mildly affected. The two that died were occasionally wet from passing under a drip during their work, while the others were not thus exposed.

The fatality was small considering the large number of animals affected by the disease. In Maine five counties report losses ranging from 1 to 6 per cent. of the animals attacked; five others report a few cases. In New Hampshire, Vermont, and Connecticut, no county lost over 2½ per cent. In Massachusetts and Rhode Island the loss in one county of each reached 10 per cent. The maximum in New York and New Jersey was 5 per cent.; in Pennsylvania, 3 per cent.; in Maryland, 3 per cent.; Virginia, 6½ per cent.; North Carolina, 1 per cent.; South Carolina, 2 per cent.; Georgia, 5 per cent.; Florida, 3 per cent.; Alabama, 2 per cent.; Mississippi, 5 per cent.; Louisiana, 2 per cent.; Texas, 15 per cent, (in Kaufman County;) Arkansas, 5 per cent.; Ten-

nessee, 4 per cent.; West Virginia, 5 per cent.; Kentucky, 4 per cent.; Ohio, 5 per cent.; Michigan, 2 per cent.; Indiana, 2 per cent.; Illinois, 5 per cent.; Wisconsin, 1 per cent.; Minnesota, 2½ per cent.; Iowa, 3 per cent.; Missouri, 1 per cent.; Kansas, 1 per cent.; Nebraska, 1 per cent. The higher maxima, however, generally indicate isolated cases. In West Virginia, for instance, most of the counties reported 1 per cent. or less, while in several there were no deaths. One county in Florida (Volusia) reports no cases.

The mortality of asses and mules was especially remarkable in portions of the South and West. In Navarro and Collin Counties, Texas, 50 per cent. of the jacks and jennets in the county died; in Cherokee, 20 per cent.; in Limestone the disease was very fatal. In Madison County, Arkansas, nine-tenths of asses and mules died. Tennessee reports a heavy mortality; Hamilton County, eight-fourteenths; Maury, 20 per cent.; Lincoln, 25 per cent.; Robertson, 50 per cent.; Monroe, 25 per cent.; Davidson, 67 per cent.; Sumner, 33 per cent.; Giles, 67 per cent.; Knox and Granger, all. A similar mortality of the asinine tribe is reported in Christian, Owsley, Taylor, and Lane Counties, Kentucky. One correspondent thinks that the majority of the jacks in Kentucky and Tennessee died. Hardly a jack or jennet was left in Montgomery County, Ohio. A heavy loss of this class of animals was also felt in Indiana, Illinois, and Missouri. In several counties in each of these States the losses included half the cases of disease, and in some cases half the number of animals in the county. In Shawnee County, Kansas, the only victims of the malady were jacks.

The mortality in horses was to a large extent caused by their being worked before they had entirely recovered from disease. In several counties it is expressly stated that no animals died except from overwork. Quite a number of counties report no deaths among their animals; of this class of counties there is in Massachusetts, 1; New York, 2; New Jersey, 2; Pennsylvania, 2; Maryland, 1; Virginia, 13; North Carolina, 17; South Carolina, 2; Georgia, 15; Florida, 2; Alabama, 5; Mississippi, 8; Louisiana, 4; Texas, 7; Arkansas, 3; Tennessee, 10; West Virginia, 6; Kentucky, 7; Ohio, 8; Michigan, 2; Indiana, 12; Illinois, 5; Wisconsin, 6; Minnesota, 5; Iowa, 5; Missouri, 10; Kansas, 6; Nebraska, 4.

The condition of animals after recovery, or at least after the removal of active symptoms of the disease, was quite various. In some counties it is reported that the general health and spirit of the affected animals were greatly improved, a result attributed to rest, good food, and extra care expended upon them. In other cases they were found to be fully up to their former *status* of flesh and strength. In others, however, a deterioration was observed, which it was feared would, in some animals, prove permanent. In many counties this deterioration is ascribed to neglect, hard usage, and premature working, but in others it cannot thus be accounted for.

DISEASES OF CATTLE.

Cattle appear to have been unusually healthy during 1872. In no county in New England, so far as reported, was there any disease prevalent to a noticeable extent. Abortion in dairy cows was prevalent in a few counties in the Middle States; the loss of calves in Montgomery County, New York, amounting to 10 per cent. In Dauphin County, Pennsylvania, cows with calf were subject to a type of influenza analogous to the epizooty among horses. This disease also appeared in Clarendon County, South Carolina, Glascock County, Georgia, and McLennan

County, Texas. In Hot Spring County, Arkansas, the symptoms were especially well marked. In Daviess County, Kentucky, a few cattle died of this malady. It appeared also in Logan County, Ohio, in St. Clair County, Illinois, and in Martin County, Minnesota. In many cases it was difficult to say how far such cases should be attributed to gross neglect and starvation.

A type of disease known in the South as the "Carolina distemper," or "murrain," prevailed in several counties of Virginia. In Lunenburgh it was regarded as an inflammation of the stomach, caused by lack of water and by eating sedge grass, which could be obviated by raising more clover and by a plentiful supply of salt and pure water. In Henry County it attacked the fattest and finest animals. In Matthews it was especially fatal among cattle imported from the North. It was violent in Halifax County, where one-third of the cattle were affected by it, and destroyed life in from one to three days. It there prevails mostly in summer and fall, and is most destructive in dry, hot seasons. In Randolph County, North Carolina, it is known as "murrain or tick disease," and is very sudden and fatal, attacking the finest animals, often cows in full milk. Diseases popularly known as murrain or distemper prevailed, to a greater or less extent, in Randolph, Stokes, Alexander, and Yadkin counties, North Carolina; in Dooly and Catoosa Counties, Georgia; in Limestone County, Alabama; in Jones County, Mississippi; in Lincoln, Wayne, Bedford, Hamilton, and Polk Counties, Tennessee; in Boone County, West Virginia; in De Kalb County, Illinois; in Caldwell County, Missouri; in Woodson County, Kansas; and in Sonoma and Del Norte Counties, California. The very diverse conditions of the animals affected, from the finest and healthiest to the poorest and most neglected, renders it very unlikely that the types of disease thus designated should be identical, or even similar.

The black leg prevailed in Grayson County, Virginia. In Pocahontas County, West Virginia, it attacked young cattle upon either an improvement or a decline in condition, resulting from deficient or abundant pasture. In Cass County, Indiana, 100 calves died of black leg, and a few cases are supposed to have occurred in Dodge County, Wisconsin. It was prevalent to some extent in Union and Monona Counties, Iowa, and quite fatal in Vernon County, Missouri, destroying 20 per cent. of the calves. In Nemaha County, Kansas, it swept 2 per cent. of the calves and 1 per cent. of the yearlings; a few fatal cases are also reported in Johnson. It was also known in Pawnee County, Nebraska, and in Douglas and El Paso Counties, Colorado.

Pleuro-pneumonia was somewhat serious around Baltimore, where the spread of the disease was far more effectually arrested by removing diseased animals than by medicines. Lung diseases of ordinary types affected dairy-cows in Kings County, New York, but farm-cattle were exempt. The hollow-horn, which one of our correspondents styles a synonym for low feeding and abuse, is reported among the old cows of Baltimore County. It also prevailed to some extent in Highland County, Virginia; in Tuscaloosa County, Alabama; in Coahoma County, Mississippi; and in Boone County, West Virginia. In Laurens County, South Carolina, ill-treatment resulted in the scours, quite fatal in some places. In Taylor County, Florida, many cattle died after eating of the plentiful live-oak mast. One farmer lost 300 head of a herd of 500. In Marshall County, Alabama, a large number were poisoned by eating ivy. An unknown disease was fatal in Chesterfield County, Virginia. In Russell County, Kentucky, a singular malady, without fatal results, caused the legs and feet to swell and remain swollen for several days.

The sore mouth, in Gibson County, Indiana, yielded to a free use of alum and salt. An occasional case of peritonitis occurred in Cook County, Illinois. In Winneshiek County, Iowa, one farmer lost three head by an unknown disease characterized by aimlessly wandering through the pasture and resting against fences or trees till the muscles would give way. After three days the affected animals died. No other cases reported. The above comprise the casualties by all diseases except the Spanish or Texas fever, which is treated under a separate head.

DISEASES OF SHEEP.

A few cases of grub in the head are reported in Sagadahoc County, Maine. Foot-rot, or scab, or both, occurred in Cheshire, New Hampshire, and in Orange, Rutland, and Addison, Vermont, and considerable dysentery, especially among lambs, in Grand Isle. In Orange County the scab was due to a single Canada flock imported. The "lung worm," in Litchfield, Connecticut, closes the list of casualties in New England. In New York the foot-rot prevailed in Steuben, Oneida, Wyoming, Ontario, Erie, and Wayne, generally to a very small extent. Scab was light in Suffolk. Sore mouth and lips were reported in Washington. Foot-rot affected half the flocks in Gloucester County, New Jersey, and existed in Salem. An unknown disease destroyed 4 or 5 per cent. in Cumberland. Scab and foot-rot prevailed in Erie, Lawrence, Beaver, and Tioga Counties, Pennsylvania, and pleuro-pneumonia in Bucks; losses small. Grub in the head to some extent affected the flocks of Saint Mary's County, Maryland, while Talbot lost 5 per cent. from scab. In Virginia an unknown disease is reported as somewhat troublesome in a few counties, such as Nansemond, Page, and Prince William. In Halifax and Northumberland a malady, showing symptoms analogous to the epizooty in horses, resulted in a few deaths. In Northumberland the disease was confined to fat sheep on two farms, many of whom had been wintered in a rye-field. Foot-rot prevailed in Jackson, Yancey, and Madison Counties, North Carolina, scarcely ever affecting sheep running in the woods, but general among pastured sheep in winter. In Randolph symptoms similar to the epizooty are reported among sheep in poor condition; 40 per cent. of the lambs died. Mitchell suffered considerably from an unknown disease. Chowan lost 3 per cent. by distemper. York District, South Carolina, lost 8 per cent. by foot-rot. In Newberry one-fourth of the grown sheep and most of the lambs were lost by influenza. In Murray County, Georgia, foot-rot prevailed to a remarkable extent. Within 6 months 20 per cent. of the whole stock died, and all were more or less affected. The scours appeared in Wilkes.

The losses of sheep reported in Florida were confined to one flock in Madison County, and amounted to 3 per cent. by foot-rot. No county in Alabama reported any sheep disease. In Mississippi the foot-rot existed in Pike, Lee, and Hancock Counties; in the latter, it was confined to the coast, the hill flocks being free. A little scab appeared in Madison, and some distemper in Jones. Louisiana reports no diseases. The scab affected half the sheep of Kendall County, Texas, and destroyed one-third of the flocks of Blanco. In Navarro this malady was found only in large flocks; Collin lost 5 per cent.; Burleson, Bee, Austin, Dallas, Washington, Medina, Galveston, Bandera, and Orange, were more or less infected with sheep diseases. These losses, in most cases, were the result of neglect and starvation. Scab is reported in Benton and Hot Spring Counties, Arkansas, and, in the latter, scab; losses small. Campbell County, Tennessee, lost 1½ per cent. by rot, which

also prevailed, though to a less extent, in Hickman, Loudon, Gibson, Bedford, Meigs, Fentress, and Hancock. In Hamilton County, one farmer lost nine-tenths of his lambs by scours, which he attributed to too close breeding. In Sumner, corn-fed sheep, kept within narrow range, lost severely. Foot-rot appeared in Cabell, Mercer, Randolph, and Pocahontas Counties, West Virginia. In the last-named county, the disease was successfully treated by paring the hoof and applying deliquescent chloride of zinc. In Marion County, Kentucky, 25 per cent. died of catarrh. The scours appeared in Larue; the blind-staggers in Ohio; and a little rot in Jackson, Adair, and Owsley Counties.

In Ohio foot-rot appeared in Logan, Medina, Madison, Champaign, Erie, Wyandot, Crawford, Geauga, Delaware, Mahoning, Perry, and Lorain Counties, the loss being generally small. The scab is reported in Madison, and Stark lost 5 per cent. from grub in the head. Perry lost 2 per cent. from "paper-skin" or "pale-skin," and epizootic-influenza. The latter appeared also in Marion. In Washtenaw County, Michigan, were a few cases of foot-rot, and, in Tuscola, of pneumonia. In Crawford County, Indiana, the grub in the head was somewhat troublesome; the catarrh in Ohio County; and sore mouth and throat in Martin. In Illinois, scab or foot-rot prevailed in a few counties, viz, Moultrie, Vermillion, Carroll, Cass, Lawrence, Wayne, Clinton, Pike, and Washington. In Lawrence the malady was general, worse than for fifteen years. In Clinton, these diseases appear to have been confined mostly to imported fine wool sheep. A decoction of tobacco was found of excellent application in scab, while foot-rot generally yielded to dry pastures and vitriol. In Walmoth County, Wisconsin, a few cases of scab and foot-rot appeared in the lowlands. In Greene, a wash of blue vitriol was found a good remedy for the latter. A few died of grub in the head in Fond du Lac, and some of epizootic-influenza in Dunn.

In Minnesota scab or foot-rot destroyed 5 per cent. in Washington County. Scab affected one-third of the sheep in Marion County, Iowa, and one-half in Madison. It also appeared in Cass, Jefferson, Union, and Wayne. In Marion 2 per cent. were affected with foot-rot. Some distemper also appeared in Iowa County. In Missouri scab is reported in Caldwell, DeKalb, Johnson, Moniteau, Newton, Ozark, Vernon, and Ralls Counties. In Vernon it affected half the sheep. In Callaway it caused a loss estimated at $800. Greene and Vernon report grub in the head. In the latter the loss amounted to 12 per cent. Iron County had some cases of murrain or dry-rot. In Linn County, Kansas, a few sheep were affected with grub in the head, and a few had the scab. The latter was developed in Chase County in an imported flock. It also appeared in Wilson and Woodson Counties, mostly in coarse wooled flocks. Some distemper is reported in Brown. Nebraska reports no sheep diseases.

In El Paso County, Colorado, scab was introduced by the importation of diseased sheep from the States, which were purchased on account of their cheapness. The disease extended to flocks previously unaffected. It also appeared in Weber, Toole, Rich, and Cache Counties, Utah. In Davis some flocks were affected to the extent of 15 per cent. with an undescribed disease; very few recovering. The marked symptoms of the malady were dullness of eyes and a peculiar shaking of the head; death usually supervened the second day. A little scab also appeared in Santa Fé County, New Mexico. A mild form of the scab was also observed in Ada County, Idaho.

On the Pacific coast the scab appeared in King County, Washington.

In Umatilla County, Oregon, half the flocks were affected by this disease, losing largely of their fleece. It also existed in Lane and Yamhill. In the latter county a few scabby sheep were imported, but the disease did not spread. In Douglas some sheep showed symptoms of poisoning, which yielded to heavy doses of Epsom salts. In California the scab prevails to a great or less extent in Contra Costa, San Diego, Stanislaus, Alameda, Mendocino, Butte, San Joaquin, Los Angeles, and Santa Barbara Counties. In Butte County the sheep is curried and sponged with a solution of blue vitriol. In some cases the animal, after shearing, is immersed in a strong decoction of tobacco, mixed with a little sulphur. The foot-rot is found in Contra Costa, and also a mild form of pneumonia, where proper feed and shelter are wanting. In Alameda the liver-rot and sore-mouth were brought in a flock imported from the east, and these maladies were communicated to flocks before healthy.

In a large number of cases above cited the disease was the result of defective nutrition, bad quarters, and other ill treatment. Very earnest complaints come from various parts of the country, especially the South, in regard to the ravages of dogs, which are productive of far greater loss than all the maladies the sheep is heir to.

DISEASES OF HOGS.

The lack of well-defined terms of description renders it difficult to classify the diseases of hogs in various parts of the country. The term "cholera" is especially indefinite, it being used in some localities as a general name for all kinds of hog-disorders. In Carroll County, New Hampshire, a few hogs confined in stables with sick horses exhibited symptoms decidedly analogous to epizooty. Bristol county, Massachusetts, reports a loss of 1 per cent. by cholera. In Orleans and Franklin Counties, Vermont, pigs and shoats were affected by an unknown disease, being taken with a weakness in their hinder parts, which they drag a few days and then die. An unknown disease caused a small loss in Suffolk County, New York. In Orange County a few cases of cholera are reported among hogs brought from the West. Traces of cholera appear also in Northampton and Beaver Counties, Pennsylvania, and in Baltimore and St. Mary's Counties, Maryland.

In Virginia the term "distemper" is occasionally interchanged with cholera, and is scarcely less indefinite. The losses were light in Campbell, Bedford, Sussex, Warren, Halifax, Northumberland, Stafford, Wythe, Gloucester, Augusta, Highland, and Southampton. In Floyd the deaths amounted to 5 per cent.; in Westmoreland, 5 per cent.; in Russell, 15 per cent. In Spottsylvania the disease was cured, in many cases, by mopping the throat with tar. In James City County the mange carried off 20 per cent. Sulphur was administered with good effect in some cases; but the most effectual method of arresting the disease was killing the infected animals. In North Carolina light loss from cholera was felt in Davie, Cumberland, Ashe, Mitchel, Stanley, Rutherford, Alexander, Rockingham, Union, Alamance, and Greene. In Burke the loss was 10 per cent.; in Chowan, Currituck, and Randolph, 5 per cent.; in Caldwell, 20 to 25 per cent.; in Lincoln, 50 per cent. In Franklin the disease was very fatal and without remedy, discouraging greatly the business of hog-raising in the future. In Yancey quinsy and cholera prevailed to some extent, the loss being 2 per cent. The staggers was troublesome in Carteret and Randolph. Severe visita-

tions of cholera are reported in Clarendon, Barnwell, York, and Newberry Counties, South Carolina. In some cases a drove was relieved of the malady by changing fields. In York County symptoms of influenza, similar to epizooty, and followed by total blindness, was fatal in many cases. In Georgia cholera or distemper was light in Marion, Muscogee, Lumpkin, Wilkes, and Dooly Counties. In Jackson it was more severe, and no effective remedy was found. In Jefferson and Pike the loss was 5 per cent.; in Upson and Schley, 10 per cent.; in Gilmer, 15 per cent.; in Brooks it amounted to one-third of the whole stock. In Pulaski 90 per cent. of the hogs were affected with "red rust," probably the disease known in other localities as "red mange."

In Madison County, Florida, the thumps and the cholera swept 20 per cent. of the stock; in Levy the thumps was considerably prevalent among pigs. In cases of recovery, nine out of ten die before the age of six months. Cholera was mild in Geneva, Jackson, Saint Clair, Marshall, Walker, and Calhoun Counties, Alabama. In Henry it was more severe, the loss amounting to 20 per cent. The "red mange" was very severe in Walker and Wilcox, in some localities sweeping three-fourths of the hogs. In Bolivar, Lee, and Loundes Counties, Mississippi, losses from cholera were light. In Tunica they amounted to 10 per cent; in Coahoma to 15 per cent. In Lafayette, cholera and "red mange" carried off 25 per cent. The latter disease produced 25 per cent. more deaths than usual in Tishemingo. In Jones County many died of kidney worms. Some cholera is reported in Morehouse, Avoyelles, and Bossier parishes, Louisiana; in Tangipahoa the loss was 20 per cent.; in Cameron, charbon, cholera, and colds reduced the stock 40 per cent. In Upshur County, Texas, about two-thirds of the hogs on hand January 1, 1872, died during the year, while one-third the usual number of pigs were born. The quinsy was general; many had boils on the liver; others were injured by the kidney-worm. In Collins and Montgomery many were poisoned with cockle-burs. In Dallas and Atacosa some cholera prevailed, and in Marion it resulted in the death of about 25 per cent. of the stock. In Kaufman an influenza, resembling epizooty, destroyed 25 per cent.

In Arkansas, so-called cholera was very destructive in several counties. Sebastian County lost 30 per cent.; Madison, 7,000 hogs; Cross, 33 per cent.; St. Francis, nearly all. In Clarke, cholera and red mange destroyed one-half, and in some localities of Columbia three-fourths of the hogs. It was also reported in Randolph. In Hot Spring, kidney-worms combined with cholera to swell the heavy loss. Some animals on being killed were found permeated with worms. Heavy losses were experienced in different counties of Tennessee: Loudon, 20 per cent.; Montgomery 15 per cent.; Dyer, 50 per cent.; Jefferson, 20 per cent.; Henry, in some neighborhoods, 60 per cent.; Madison, in some places, 75 per cent.; Humphreys, 20 per cent.; De Kalb, 25 per cent.; Williamson, 20 per cent.; Jefferson, 20 per cent.; Robertson, 10 per cent.; Cannon, 10 per cent.; Lewis, 10 per cent.; Weakley, 10 per cent.; Lawrence, one-ninth; Davidson, one-eighth. Minor losses are reported in Smith, Lincoln, Fayette, Campbell, Wayne, Grundy, Bedford, Jackson, Putnam, Monroe, Hickman, Hamilton, Maury, Polk, Greene, Giles, Fentress, and Hancock. In some cases quinsy and pneumonia were troublesome. The following from Gibson reports the disease somewhat at length:

The fatality among the hogs during the past year has been very great, many farmers losing almost their entire stock and others nearly one-half. For want of a better name, the disease was usually termed "cholera," though no symptoms of that disease were manifested in any of its stages. It first made its appearance in the latter part of

July, and continued until the frost, when it ceased. It spread very rapidly and numbered its victims upon every farm. The extremely dry weather that prevailed led many to suppose that it was caused by the inhalation of dry dust, or famishing for want of water. The symptoms were: first, a dry cough, running at the nose, constipation of the bowels, and a general prostration of the whole system. A reeling, straggling walk, with loss of flesh, though the appetite continued good, usually denoted its approach; a cough was also present. Some treated for disease of the liver or kidneys, but without success. All efforts at treatment or staying the progress of the disease were futile. In my own experience I found a diet of warm kitchen-slops, with bran and salt, afforded the greatest amount of temporary relief. Before death a slight purging usually took place, with froth or foaming at the mouth. The duration of the disease, from its invasion to its fatal termination, was usually from a week to ten days. About 33 per cent. of the hogs of this county died from this disease. In its general features it resembled more particularly the "epizooty" of the horse than "hog cholera," and might have been so called if the "horse disease" had then been known.

In Putnam County, West Virginia, some neighborhoods lost 75 per cent. from cholera; Boone averaged 25 per cent., generally the best hogs; Graves 20 per cent.; Kenton, Johnson, Butler, Mason, and Kanawha, 10 per cent. each; the loss was light in Cabell, Jackson, and Hardin. Some quinsy was reported in Pendleton. In Morgan a few cases of "blue sickness" yielded to alum dissolved in meal-slops, two or three doses being sufficient in the earlier stages. The aggregate loss was heavy in several counties of Kentucky; Christian and Ohio, 25 per cent. each; Spencer and Graves 20 per cent. each; Johnson, Daviess, Kenton, Warren, Butler, and Rockcastle, 20 per cent. each; smaller losses were felt in Clarke, Shelby, Jefferson, Jackson, Lewis, McLean, Trimble, Anderson, Boone, Breckinridge, Lane, Lincoln, Livingston, Carroll, Hopkins, Oldham, Russell, Magoffin, and Adair. In Grayson one-third of the cases were fatal. In Nicholas disease was confined to distillery-hogs. In Metcalfe the mange was unusually severe. Quinsy and measles are incidentally mentioned in one or two cases.

North of the Ohio River, hogs appear to have been comparatively healthy. Jefferson County, Ohio, reports a loss of 2 per cent., while traces of disease are found in a few other counties. In Michigan and Wisconsin every county reports no prevailing malady. Indiana and Illinois, however, are less fortunate. In the former State Johnson County lost 75 per cent.; Morgan, 33 per cent.; Gibson, 30 per cent., with a declining interest in hog-raising; Warrick and Owen, 10 per cent. each; Grant, Perry, Decatur, Huntington, Warren, Dearborn, Carroll, Cass, Howard, Clinton, Parke, Clay, Hamilton, Posey, Martin, Tipton, and Newton, smaller losses, sometimes trifling in extent. An occasional case of thumps varies the record. In Wabash County, Illinois, 75 per cent. of the young hogs died. In Pope County the loss from all causes was 30 per cent.; Pulaski and Clinton, 25 per cent. each; Mason, Franklin, and Putnam, 20 per cent. each; Pike and White, 10 per cent. each; smaller losses in Vermillion, Morgan, De Kalb, Schuyler, Carroll, Grundy, Montgomery, Hancock, Sangamon, Wayne, and McLean. In Franklin County many of the best-fed hogs died of a new and unknown disease, commencing with weakness in the hind legs, which the animal dragged after him, from twelve to twenty-four hours, and then died, the carcass assuming a very dark color. In Macon County disease appeared to run in droves; one man got rid of it by selling out his stock and repurchasing. The influenza, analogous to epizooty, appeared in Putnam and Saint Clair Counties.

In Washington County, Minnesota, there was a loss of 7 per cent., no other county in the State reporting any casualties. The different forms of disease were more virulent in Iowa, Adair County losing 30 per cent.; Tama, 25 per cent.; Polk, 20 per cent.; Mahaska, 15 per cent.; Louisa, and Fremont, 10 per cent. each; Ringgold, Iowa, Marion, Clinton, Cass,

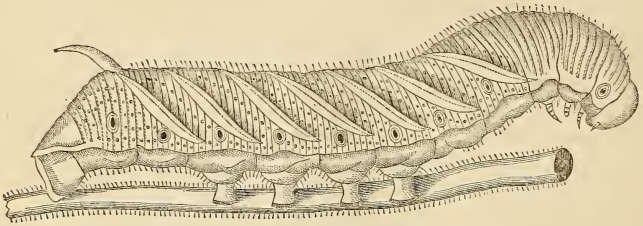
Jasper, Page, Johnson, Lucas, and Dallas, 5 per cent. or less. In Johnson, from 500 to 1,000 hogs died of cholera and quinsy. In Powieshiek, an unknown disease swept 25 per cent. of the pigs. In Muscatine, the "anthrax fever" prevailed in some localities, but was not general. In Pulaski County, Missouri, one-half the hogs died. Pemiscot and Worth lost 20 per cent.; Barry, 15 per cent.; Ozark, 25 per cent.; Grundy, Linn, and Wright, 10 per cent.; smaller losses from cholera, pneumonia, &c., were reported in Caldwell, De Kalb, Bolinger, Callaway, Daviess, Moniteau, Perry, Carroll, Stoddard, Marion, and Lincoln. In Holt County, one-half the young hogs were destroyed by a singular disease, the prominent symptoms of which were cough and swelled throat; one-third of the older hogs died from another malady, characterized by stupidity, loss of appetite, &c., sometimes obviated by merely changing the animal's quarters and bedding. The above symptoms strikingly resemble the epizooty. In Nodaway, kidney-worms destroyed 15 per cent. of young hogs. But two counties in Kansas—Brown and Chase—report losses, and in both cases light. In Nebraska, Cass County lost 10 per cent.; Richardson and Pawnee, a few cases each. In Alexander County, California, some Kentucky hog-pedlers imported diseased animals, which infected others there and in other counties. In Mendocino County kidney-worms were somewhat troublesome.

ENTOMOLOGICAL RECORD.

By Townend Glover, Entomologist.

The tobacco-worm.—The tobacco hawk-moth or "horn-blower" of Maryland, *Macrosila* (*Sphinx*) *carolina*, Linn., is a large moth, the caterpillar of which, commonly known as the tobacco-worm (Fig. 3) in the

Fig. 3.



Middle States, is very destructive to the leaf of the tobacco-plant, when the worm is young, by eating holes in the leaves, thus spoiling them for use as wrappers for cigars, and when old by devouring the whole of the leaf itself. These worms appear of all sizes, during late summer and autumn, in the tobacco-fields in Maryland, the first brood of eggs hatching in May or June.

During the last season the Department has received numberless letters on the subject of their ravages, desiring information concerning their habits, and the best remedies that can be suggested for their destruction. We shall therefore give a short description of their transformations from the egg to the perfect fly. The egg is deposited singly on the leaf of the tobacco or tomato plant, and the young worm when first hatched out by the heat of the sun commences to eat holes in the leaf of the plant, and sheds its skin several times before attaining its full

size; it then goes into the earth and the pupa (Fig. 4) is formed in a subterranean cell, the late broods remaining as pupæ all winter, and coming out as the perfect fly the following spring. The insect (Fig. 5) appears from June and July until late fall. It hovers in the twilight like a humming-bird over flowers, especially honeysuckle and Jamestown weed, *Datura stramonium*, sucking the nectar by means of its long, flexible tongue, which, when the insect is at rest, is coiled up like a watch-spring under the head. The tongue when unrolled measures four to six inches in length, and the caterpillar feeds also on the potato, red pepper, and tomato, as well as the tobacco. This insect is almost exactly like the northern so-called potato-worm in all the states of larva, pupa, and insect, and can scarcely be distinguished from it by young entomologists; but in the "tobacco-worm" the anal horn on the tail of the caterpillar is *reddish* instead of bluish; it also has no longitudinal white stripe, the pectoral feet are ringed with black, the body is more hirsute, and the insect itself is more indistinctly marked, and always has a white mark at the base of its wings and partly on the thorax, (Fig. 5) which the moth of the potato-worm has not. (Fig. 6.)

Fig 4.

Fig. 5.

The potato-worm is also found feeding on the tobacco in Maryland, and frequently a black or nearly black variety of the worm is taken, especially towards the end of the season. The potato or tomato worm has also been accused of being poisonous, but this is entirely erroneous, as the horn on the tail of the caterpillar is incapable of inflicting any serious wound, and has no poisonous properties whatever. The potato-worm is the northern species, and in Maryland the two species meet, and are found indiscriminately together in the tobacco-fields, yet never mixing, but remaining perfectly distinct, although so nearly allied in appearance, habits, and food.

There are several parasites, and one in particular, that is very useful in destroying the potato and tobacco worm. It is a minute, four-winged fly, (*Microgaster congregata*,) which deposits its eggs in the caterpillar, and eventually kills it. The eggs of this parasite, to the number of one hundred or more, are deposited in the back and sides of the caterpillar, in small punctures made by the ovipositor of the fly. The larvæ, when hatched, feed upon the fatty substance, and when fully grown eat

a hole in the skin, and each maggot spins for itself a small white oval cocoon, one end of which is fastened to the skin of the worm, and the caterpillar appears as if covered with small oval white eggs. Eighty-four flies were obtained from one caterpillar by Say, and Fitch counted one hundred and twenty-four cocoons on another worm, so that these insects must destroy a great number of worms. The parasite, however, is said to be destroyed by another hymenopterous insect, (*Pteromalus tabacum*,) which deposits its eggs in the cocoons of the microgaster. Another species, forming an immense mass of loose woolly cocoons, is also said to kill the caterpillar of the potato-sphinx, and most probably

Fig. 6.

attacks also that of the tobacco-worm in a similar manner. It is, therefore, of great consequence when destroying the caterpillars by hand-picking to avoid crushing or injuring any caterpillars which appear to have either white floss or egg-like cases on their backs or sides, as these are the cocoons of a very useful insect, which, if left undisturbed, would produce multitudes of flies, which would destroy an immense number of these injurious worms.

The hornets, and an orange-colored wasp, taken by Walsh for a *Polistes*, devour the caterpillar when young and small. The best remedy against these insects, however, is to poison the fly which produces either the potato or tomato worm, by dropping a mixture of "blue stone" of the druggists, or crude black arsenic, into the flower of the Jamestown weed, or stramonium, in the evening, when the fly will come and insert its long proboscis into the flower, sip up the poisonous mixture, and die before depositing its eggs.

A correspondent from Tennessee finds it advantageous to cultivate a few plants of the Jamestown weed among his tobacco, and then to poison the blossoms, as they appear, with the above-mentioned liquid, every evening, and has thereby saved a great part of his crop uninjured. In Maryland some tobacco-growers utilize young turkeys by driving them into the tobacco-field, where they pick the worms from the leaves. Some planters also pay a small premium to children for the dead millers or flies, which are readily killed with a piece of shingle or board as they hover over the flowers in the evening twilight.

CHEMICAL MEMORANDA.

By Wm. McMurtrie, Chemist.

Proximate analysis.—Proximate analysis may be classed among the most difficult processes of analytical chemistry. It not only requires patience, but often yields results which fail to produce the satisfaction desired. To reduce the difficulties to a certain extent, and to devise a method which will yield satisfactory results, and insure economy in time and expense, has been in part the object of the work in the laboratory during the past two months, and, as was stated in our last month's report, we shall now proceed to the publication of our method of analysis.

Since the separation of the several proximate principles depends upon the action of different solvents, the work of devising a method of effecting it obviously consists in the selection of such as are best suited to the purpose, as well as the best means for applying them. In the selection of solvents, attention must be paid to their *wetting* powers as well as their power of solution. Thus ether will dissolve a larger proportion of oil than bisulphide of carbon, but the latter being more penetrating will extract the oil from the meal more readily than the former. We have therefore chosen as solvents to be used in the following method, bisulphide of carbon, alcohol of 85 per cent., water, and dilute acid and alkaline solutions.

The best mode of extraction of the different principles with solvents is by percolation, and this operation may be very materially aided by the use of the Bunsen pump. In order that the residues may be dried and weighed without destroying the filter, Munroe's porous earthenware cones, 1½ inches in diameter, are used, and these are fitted into glass funnels by means of a ring of rubber tubing.

The material having been carefully and finely pulverized, take two samples of 2.5 to 3 grammes each, heat at 130° C. until constant weight is obtained, in order to determine the moisture. Then place them upon the porous cones and determine the oil by extraction with bisulphide of carbon. The residue after this extraction, as after each succeeding one, must be dried at 130° C. until constant weight is obtained. The oil having been removed, the two samples are treated for zein, sugar, and gum as follows: Let the cones be numbered respectively 1 and 2. Treat the contents of No. 1 with alcohol of 85 per cent., which will remove the zein and sugar. After having dried and weighed it, treat the residue with water to remove the gum; dry and weigh. Treat the contents of cone No. 2 with water to remove the gum and sugar; dry and weigh. The amounts of zein, gum, and sugar may now be calculated as follows:

Treatment of No. 2 with water = gum and sugar.

Second treatment of No. 1 = gum.

First treatment of No. 1 = zein and sugar.

Gum + sugar − gum = sugar.

Zein + sugar − sugar = zein.

The substance having been treated as above is transferred from the cone to a beaker 12 inches high and 3 inches in diameter, and boiled for two hours with 200 c.c. of water containing 0.5 per cent. of sulphuric acid. As the water evaporates it must be supplied. After boiling, the beaker is filled with hot distilled water, the residue allowed to settle, and the clear supernatant fluid is drawn off as completely as possible, by means

of a siphon, without disturbing the residue, which is then transferred to the filter, washed with boiling distilled water, dried and weighed. The loss denotes the amount of starch, and the residue consists of albuminoids and cellulose. These may be separated by treatment with water containing 5 per cent. of caustic alkali, which will remove the former, leaving the latter as a residue.

The ash is determined by taking another sample of 2.5 to 3 grammes, and incinerating it in a platinum crucible. The mineral matter is then deducted from the various principles with which it may have been removed in the process of extraction. We have determined by experiment that extraction of the different substances removes the following percentages of the whole amount of mineral matter present for each of the constituents. Thus the amount removed with—

	Per cent.
Zein	7.5
Albuminoids and cellulose	10.5
Gum	37.6
Starch	44.4

The nitrogen should be determined as a check upon the zein and albuminoids.

Since a great deal of time must necessarily be lost in working the above method, we prefer the following, which, although it involves the same principles, may be prosecuted in much less time.

For this method weigh out five samples of 2.5 to 3 grammes each, place them upon porous cones which have been previously washed and ignited, and numbered respectively 1, 2, 3, 4, and 5, heat at 130° C. until constant weight is obtained. Treat the contents of cone No. 1 with bisulphide of carbon, dry and weigh. Before weighing, the residues must be well dried at 130° C. Loss in weight of cone and contents = moisture and oil.

Treat the contents of cone No. 2 with bisulphide of carbon and alcohol of 85 per cent. consecutively, without removing the cone from the filtering funnel. After this is done dry and weigh. Loss = moisture, oil, zein, and sugar. In the same manner treat the contents of cone No. 3 with bisulphide of carbon and water. Dry and weigh. Loss = moisture, oil, gum, and sugar. Treat cone No. 4 with bisulphide of carbon, alcohol of 85 per cent., and water. Loss = moisture, oil, gum, sugar, and zein. Treat cone No. 5 in the same manner as No. 4, and, without drying, transfer the contents of the cone to the tall beaker described in the former method, and proceed with treatment for starch as described above. After the starch is removed, the albuminoids, cellulose, and mineral matter are determined as in the preceding method.

We give below the composition of two varieties of Indian corn, which were analyzed according to the above method. These were chosen to represent the crops of the North and South; as was stated before, the yellow corn represents the Northern crops, and the white corn those of the South. On comparing the two analyses it will be seen that the variation in composition is not very great, the gum, sugar, and albuminoids being the most variable.

No. 1 is a sample of yellow corn grown upon the farm of the Commissioner of Agriculture, in Pennsylvania. Although the analysis of this sample was published last month we reproduce it here for comparison, and give it calculated for dry substance. No. 2 is a sample of white corn grown upon the eastern shore of Maryland.

No. 1.

	Undried substance.	Dry substance.
Moisture	8.87	.....
Oil	5.17	5.67
Sugar	1.10	1.21
Gum	1.23	1.35
Zein	1.98	2.17
Starch	70.66	77.54
Albuminoids	7.94	8.71
Cellulose	1.72	1.89
Ash	1.33	1.46
	100.00	100.00

No. 2.

	Undried substance.	Dry substance.
Moisture	8.03	.....
Oil	5.61	6.10
Sugar	2.45	2.66
Gum	0.97	1.06
Zein	1.45	1.58
Starch	70.36	76.50
Albuminoids	8.36	9.09
Cellulose	1.53	1.66
Ash	1.24	1.35
	100.00	100.00

NOTES FROM FOREIGN JOURNALS.—We quote the following from M. Maumevé's "*Fermentation without Ferments*," published in *Les Mondes*: "Heretofore no real explanation of the rôle of manures has been given, but a little reflection readily shows the interest contained in the explanations furnished by my theories upon the alterations of the salts and their application to the nourishment of plants. It is quite clear that the soluble matters employed as manures are either very stable or are easy to decompose. Their degree of stability affects their nutritive value. But this stability has not, as yet, been attached to any known principle. The principle of my theory, just spoken of, shows the enormous influence of the inequality of the equivalent weights of the acid and the base upon the salts. An active manure is one which presents this inequality, because it will certainly give rise to other salts which show but little or none. The manure will be not only *active* but especially *nutritious*, if the products of decomposition, conformably to the law of mixtures, are of a nature to be absorbed by the plants, thus facilitating their production by means of the powerful effects of the osmose of the walls of the cells, tubes, &c. The separation of a certain quantity of alkali, as in the alteration of acetate of soda, or a certain quantity of acid, as in producing other salts, explains the movements of vegetation, the formation of insoluble deposits, &c. This subject is one to which I shall return, in order to show, by examples, in what manner my new discovery may become valuable."

Sugar-beets.—M. Corenwinder, in the name of the Agricultural Station of the North, in France, has determined, from experiments, that those beets are richest in sugar which produce less weight. Cultivators should, however, consider the fact that it is possible to obtain beets which are at the same time rich in sugar and of high specific gravity. For this, it is necessary to increase the number of experiments, sow seeds producing rich beets, improve by judicious selection, and renew the varieties which may degenerate. M. Corenwinder also relates the following fact which he has recently observed: "It is disadvantageous to cut the leaves from the beets after they have been gathered, for when they are left for some time in this decapitated condition, the sugar disappears in considerable quantity, on account of an elaboration which takes place in the cells with a view to the production of new buds."

Professor Jellet, president of the Royal Irish Academy of Dublin, has made the following experiments upon the growth of sugar-beets in Ireland: Four specimens were taken, and in the growth of one the manure used was common salt; in the second case sulphate of potash was used; in the third case no manure was used, and in the fourth case sulphate of ammonia. By optical experiment it was determined that the yield in the first case was 79.99 per cent. of water and 12.72 per cent. of sugar; in the second case, 80.27 per cent. of water and 13.18 per cent. of sugar; in the third case, 80.60 per cent. of water and 12.42 per cent. of sugar; and in the fourth, 80.52 per cent. of water and 12.54 per cent. of sugar.

Lunar light upon vegetation.—Mons. P. Charbonnier, in a communication to the *Journal d'Agriculture Pratique*, states that lunar light exerts a material influence upon aquatic vegetation. This fact was first noticed from the increased growth of cryptogamic vegetation upon the sides of an aquarium. It was observed that during the time of full moon it was much more luxuriant than during the time of the new moon. This led to other observations with regard to it, and it was found that aquatic vegetation generally is affected in a similar manner.

New coloring matter.—M. Harston has extracted from *Agaricus fasciculatus* a coloring matter soluble in ether and crystallizable in plates, to which he gives the name *Mycoraphine*, and another matter, which he named *Mycostearine*, insoluble in ether and water, and present under the form of granules which have a reniform structure.

The red berries of *Solanum dulcimara*, those of *Tamus communis*, and *Asparagus officinalis* have also furnished a red granular substance, crystallizable in plates. It is insoluble in water, but soluble in alcohol and ether, and especially in benzine. Sulphuric acid colors it blue. It is easily fixed upon silk.

Rhizoctone.—*Les Mondes* of February 6, contains a statement to the effect that beets grown in the vicinity of Eghezer are affected by a peculiar malady heretofore unknown to agriculturists. The roots are covered with numerous and tangled filaments, which upon examination prove to be a fungus of the genus *Rhizoctone*. This fungus is developed upon the roots of certain vegetables, constituting a terrible malady. It has heretofore been noticed upon saffron, lucerne, &c. Whole fields of these have been destroyed by it. It has also been found upon potatoes, and now it has appeared upon beets in Belgium.

Lacquer.—C. Puscher prepares a lacquer of oleate of alumina, which will stand quite high temperatures, in the following manner: to a solution of alum is added a rather dilute, boiling solution of soap. The precipitate which is formed is allowed to settle, the fluid decanted, the former collected upon a filter, washed with boiling water and dried. It is quite trans-

parent, and is soluble in all proportions in turpentine, and when dissolved in it may be applied to all the purposes for which *lacquer* is used. After its application it should be dried quickly at about 50° C.

Freezing of plants.—Professor Fr. Mohr, reasoning from certain observed facts, believes that the destruction of plants by freezing is due to the expansion of the fluid in the cells, thus bursting their walls and stopping the processes of vegetation. The destruction is effected principally in those plants which have large cells, and therefore containing a large amount of fluid, while those provided with small cells, and consequently containing but a small quantity of fluid, remain uninjured. If, however, the latter be attacked before the fluid has disappeared from them sufficiently in the fall, or after it has re-appeared in the spring, they will also be affected. He also states that it is impossible to determine the temperature at which plants (sprouts of vines, potatoes, &c.) are destroyed, since it is probable that they may become much cooler by radiation than the shining bulbs of the thermometer.

BOTANICAL NOTES.

By Dr. George Vasey, Botanist.

Interesting example of fasciation.—Several specimens, showing an abnormal vegetable growth of the variety called fasciation, have been sent by Dr. A. Schottman, of Texas, who gives the following history of the case:

About twelve years ago a small shrub of a kind of sophora, growing in the mountainous region of Texas, was planted in my garden. It grew very well, and a few years afterward, in early spring-time, it became covered with buds, promising an abundance of flowers. But the first year all these buds dried and disappeared, but the *peduncles* increased, both in length and breadth. A few weeks later the shrub was adorned by handsome hangings of a silvery-gray color, like white cockscombs. The stipules of the aborted flowers were very numerous and somewhat aculeate. In the winter following, these hangings (malformed peduncles) fell off, and in the spring of the next year *new* buds made their appearance, on new peduncles. Since that time, about six or seven years ago, my shrub has been every year very ornamental, bearing an abundance of violet flowers and handsome legumes. In the fall of 1871 the soil around my sophora was cleaned, manured, and plowed, and in the spring of 1872 the shrub *anew failed* to produce flowers: only the above-described hangings covered it. Last winter, although a long and hard one, did not kill these deformities, and now, in the middle of March, 1873, they are almost all covered with flowers.

This kind of abnormal growth occurs in many herbaceous plants, as in celosia or cockscomb, and occasionally in woody plants. It generally consists of a flattening and expansion of the stem or branch, with an unusual development of buds produced without regular order. Several causes have been ascribed for this monstrosity. Professor Hinks explains it on the principle of adhesion, arising in cases where, from superabundant nourishment, especially if accompanied by some check or injury, numerous buds have been produced in close proximity. It is stated that the means employed by horticulturists in the cultivation of the cockscomb, so as to insure the production of the very large flower-stalks for which this plant is admired, is the application of a large quantity of stimulating manure and the maintenance of a high temper-

ature. In woody plants this deformity is generally confined to some of the branches, its occurrence in the flower peduncles being rare. The specimens of the sophora above mentioned (*Sophora speciosa*, Benth.) are affected in different degrees, some showing the peduncles but little flattened and expanded upward like a club, while the largest is 9 inches long, swelling out in the shape of a trumpet, but perfectly flat, 5 inches broad at the summit, which is plaited, scolloped, and gashed or split into several sections. The flattened surface is covered with a multitude of small points, which are undeveloped flowers, each of which has a small pointed bract below the bud, and in several places toward the summit a number of the buds have developed into ordinary flowers, irregularly scattered, each with a short pedicel. About twenty-five of these flowers occur on one specimen, while the undeveloped buds amount to several hundred. In the normal state the flower peduncles fall off after the maturity of the flowers or fruit, as they did in this case until the last year; the persistence of these abnormal, hypertrophied peduncles, and the subsequent development of flowers upon them, being very remarkable. The tree which is the subject of this peculiarity much resembles the *Sophora japonica*, and would probably be equally ornamental in cultivation. In Texas it is evergreen, the specimens showing last year's leaves and also young ones of the present season.

CONSULAR COMMUNICATIONS.

THE VINE DISEASE IN FRANCE.—THE PHYLLOXERA VASTATRIX.—The Department of Agriculture has received, through the Department of State, the following communication from M. M. Price, esq., United States consul at Marseilles, embracing a variety of statistics in reference to the origin, nature, and extent of the disease which for several years has so extensively devastated the vineyards of France:

It is now nearly ten years since certain cultivators at Pujaut, Roquemaure, and Villeneuve, in the department of Gard, a few miles from Avignon and on the right bank of the Rhone, called attention to a new disease of the vine. It was first called "*la pourridie*," (the rot,) from the fact that the vines which died were found to have their roots completely rotten. No attention was paid to the matter except by those immediately interested, who found their vines rotting away from year to year, without any of the remedies tried having proved efficacious in arresting the increasing mischief. Four years passed, and the "rot" continued, thus unnoticed, to pursue its destructive work in the best-cultivated wine district of Provence and Languedoc, until the severe winter of 1867--'68 developed the evil in such proportions that at length, in the summer of 1868, was sounded the first note of alarm, which came from a committee appointed by the prefect of Gard to examine the nature and explain if possible the causes of the new disease. The committee reported the discovery of a microscopic insect feeding upon the roots of the diseased vines. Professor Planchon, of the College of Montpellier, claims the honor of having classed and named the interesting bug. He called it at first the *Phyzaphis vastatrix*, but afterward changed it to *Phylloxera vastatrix*. It was found upon examination that the insect commenced its work by attacking the hair-like filaments of the vine-root, thence gradually extending its ravages through the entire *plexus* of radicles and larger roots, till all was rotten and destroyed. A singular thing noticed was that generally the vine preserved its usual healthy appearance, gave its usual complement of grapes, and then suddenly collapsed and died. By degrees public attention was excited. The Minister of Agriculture and Commerce, the Academy of Sciences at Paris, and the Society of Agriculturists of France, instituted inquiries. A reward of 20,000 francs was offered by the government to whoever should discover an effectual remedy, and other smaller rewards were offered by departmental societies, which have never yet been claimed. In the fall of 1868, M. Mares, secretary of the agricultural society of Hérault, made an excursion through the infected region to ascertain the extent of the disease and the direction of its course. He found it to extend from Roquemaure in Gard, north to Rochegude, in Drôme, and south

a little beyond Arles, in the Bouches-du-Rhône, a distance of nearly one hundred miles, while east and west the distance was about seventy-five miles. Of Roquemaure, he says: "That beautiful vine-country, which last fall was in full prosperity, covered with vines, young and old, the cultivation and care of which are perfectly understood, is this year in greater part attacked and most of its vines dead or dying." He found the district of Ramières completely devastated, and the disease extending in every direction. No remedy having yet been found, the march of the disease has been unimpeded, and is thus traced in a recent publication: "In 1864 the Phylloxera crossed the Rhone from Gard to Vaucluse, and in that and the following year desolated many vineyards at Sorgues, Camaret, Sainte Cecile, and Châteauneuf du Pape. In 1866 it descended to St. Rémy, Graveson, and as far south as La Crau de St. Martin in the Bouches-du-Rhône. In 1868 it was at Terrascon, Senas, and Cadarache. In 1869 it had invaded the country around Arles, Orgon, and Miramas, the plain of Vannage, and the famous vineyards of Langlade, in Gard. In Langlade it destroyed vines planted in the days of the regency—one hundred and fifty years ago. In 1870 it appeared at Lunel, St. Jean de Lucules, and St. Gely du Fesc. The country of the famous Muscat wines, in the department of Hérault, up to that time had been considered untouched.

In 1871 it continued its march through Hérault in a southwesterly direction, and attacked Mauguio, Cadenet, Boisteron, Lattes, and Vendargues, to the south of Montpellier, and in the same year advanced north as far as Valence, in Drôme, and east to some points in the department of Var. It appears that this scourge, after having crossed the Rhone several times, is now marching upon Lower Langnedoc, in two nearly parallel columns. One appears to have taken its departure from St. Rémy, in Vaucluse, or from Arles, in the Bouches-du-Rhône, and to have proceeded, going south of Nimes, toward Cette, crossing Lewel, Mauguio, and Lattes: the other starting from Gigondas, eight or ten miles northeast of Orange, in Vaucluse, crossing Châteauneuf du Pape, in a line north of Nimes, threatens Béziers in the southern center of Hérault. The district of Laveyron, on the border of Drôme and close to the southwestern corner of Isère, has been reached. Taking the mountain-range of the Cévennes on the west and the departments of Hautes Alpes and Basses Alpes on the east as boundaries, we find all the intervening country more or less ravaged by the Phylloxera.

Starting from Laveyron, in Drôme, going in a southwest line to Cette on the coast of Hérault, thence to Toulon, and back in a straight line to Laveyron, we have a vast triangle of the seven departments whose vineyards are being slowly destroyed. Including Gironde, eight of the most important departments in the richest wine-growing country in the world are reduced to-day to a melancholy condition. Taking them in the order in which they have suffered, they may be placed as follows: First, Vaucluse; second, Bouches-du-Rhône; third, Gard; fourth, Drôme; fifth, Hérault; sixth, Ardèche; seventh, Var; and eighth, Gironde. A few figures taken from official sources will give a more correct idea of the amount of damage suffered. Vaucluse had about 75,000 acres planted in vines in 1868, the average production of wine being about 160 gallons to the acre.

At this time last year 40,000 acres around Orange were destroyed. In the present year, of the 75,000 acres of vines existing in 1868, fully two-thirds are utterly destroyed, and the other third is seriously threatened. The saddest reflection is that the work of destruction has been most complete among the most celebrated brands. In the district of the Châteauneuf du Pape, all the varieties, La Nerthe and others, have been swept away in the common ruin. In the Bouches-du-Rhône fully one-half the vines are dead or dying.

In 1868 there were about 125,000 acres, producing, on an average, not more than 80 or 100 gallons per acre. The disease exists in all the country from near Avignon along the western border to Arles; thence southeast to Berre, and northeast to the river Durance. The most famous brand is produced at Cassis, on the southeast coast, near Marseilles. All the country east of Marseilles may be said to be more or less devastated.

The department of Gard had about 440,000 acres of vines in 1868. Although about 100,000 acres have been injured, the wine-crop will not be sensibly diminished this year. The average production, hitherto, has been about 300 gallons to the acre. The most esteemed brands are those of Tavel, Langlade, and some light wines.

Tavel and Langlade have disappeared. In 1868, a vine produced at Vauvert obtained a gold medal at an exhibition. The *Phylloxera* appears to have appropriated it and several other gold-medal vines to its own use. The department of Drôme, with over 60,000 acres of vines, has suffered more than Gard. The vineyards along the Rhone, in this department, are being rapidly destroyed. Here is produced the renowned "Hermitage," and probably the last crop has been harvested. The wines of Drôme are all of a superior quality. Héranlt is the first in rank as a wine-producing department, both in respect to the number of acres and the quantity of production. In 1867, of the 750,000 acres of the cultivated land of the department, there were 410,000 devoted to vine-culture. In the present year there are 530,000 acres. The product per acre was 500 gallons in 1867, and in the remarkable year of 1865 it was estimated at 750

gallons of wine to the acre. In the present year, in spite of the *Phylloxera*, the product of Hérault will reach a probable total of 350,000,000 gallons. As usual, the best brands have been among the first victims of the disease. In Ardèche, situated along the right bank of the Rhone, there are about 80,000 acres of vines. Up to the present the disease has destroyed or badly damaged from 25,000 to 30,000 acres.

In the department of the Var there are about 200,000 acres of vines, producing about 100 gallons to the acre. The principal brands are Gaude and Lamalgue, Bandole, Bansset, Castellet, St. Cyr, and la Cadière, all deep red, solid wines. The damage done in this department will not exceed one-third of the vines. There are in the Gironde about 325,000 acres of land devoted to the vine. The average product is about 200 gallons to the acre. Two years ago the quantity of land attacked by the *Phylloxera* was estimated at 50 acres; but the disease now extends over ten kilometers and is rapidly spreading. It would be wonderful if it did not continue to spread, when during the past summer wagon-loads of diseased vines were carried from the country around Floirac, across the river, to be burned on the Médoc side—an insane proceeding and a sure means of spreading the disease. We shall probably have one or two more crops of the renowned Château Lafitte, Château Margaux, before they disappear. The vineyard of the famous "Hermitage" occupies the side and summit of a hill on the left bank of the Rhone, a short distance north of the town of Tain, in the department of Drôme, and contains about 375 acres. It is worth from two to six thousand dollars per acre. The product of the Hermitage is 212 to 264 gallons per acre. The universal testimony is, that no soil and no species of wine can claim exemption from the *Phylloxera*. It first followed the course of the Rhone, south through a soil which is nothing more than a pine *detritus*. It next attacked the marshy deposits or paludian soil north of Avignon, and since then every variety of ground, whether light or heavy loam, calcareous, argilaceous, or sandy soil, has proved a matter of perfect indifference to the *Phylloxera*, which makes itself at home everywhere. In connection with its appearance at Roquemaure, two phenomena have been noticed, which preceded, and it is supposed may have had much to do with, its rapid development. The first is the extraordinary length of a period of drought in a country accustomed to mild visitations of that nature; and the second is the unusual severity of the winter of 1867–'68. The drought lasted eighteen months, and the cold froze everything that would freeze, splitting the vines and opening the ground in long, deep fissures. The vines thus split open were found in almost every instance to be filled with *Phylloxera*, and the theory is, that the insects left those insecure dwellings in search of better, using the fissures in the ground as sheltered roads through which to travel. This is all very plausible, and even true, but it is now known that at a certain period of its short life this microscopic animalcule becomes a winged creature. It is extraordinarily prolific. A single female will become, in the third generation, the happy grandmother of eight millions of her own living images. It has not yet been settled whether this insect is male and female or exclusively female. The winged individuals are all females, and so far as observed, those that do not become winged are also females, and much more prolific than the former. The hope was indulged by some that the insect, whether the cause or consequence of the disease, was generated by the climatic conditions spoken of and would disappear of itself in time, if the unfavorable conditions ceased. But here again science is at fault. The word "unfavorable" here means favorable to the insect, and it would appear that all kinds of weather are equally favorable to it. Intense cold and intense heat find and leave it in the enjoyment of robust health and perfect contentment. Never was there a living creature so charmingly resigned to all the accidents of checkered existence. It cannot be drowned, for after having been kept in water for two weeks, it emerges from its bath a fresh and frisky creature ready for the next vicissitude. Professor Planchon asserts that the *Phylloxera* is a "Yankee invention," which others deny. The professor quotes C. V. Riley, of Missouri, Asa Fitch, of New York, and Mr. Flagg, of Cincinnati, who say that the American *Phylloxera* is identical with that now ravaging France. It was introduced with certain American grape-vines, says the professor, sent to France by the State Department at Washington. The pamphlets upon the subject of the *Phylloxera* abound, but none have discovered a remedy. Sulphur has failed in some places, and been pronounced effectual in others. Quicklime shows no better record. A distinguished member of the French academy said that the disease was simply due to bad cultivation and negligence, and recommended to pull up the sick vines by the roots and burn them, and it was even proposed to make the thing compulsory upon the cultivator. Inoculation with turpentine, carmine, sulphate of copper, sulphide of potassium, &c., has been tried. Lime in various shapes, pyrites, soot, ashes, a variety of composts, coal-tar, carbolic acid, hot water, petroleum, naphthaline, sulphuric acid, mustard-plasters, arsenic, and a hundred other remedies have been tried, and all have failed to have any effect upon the indurated heart of this horrid little bug. It may be possible that this disease will not cross the Cévennes from the east, but it is just as possible that it may extend west from Gironde and destroy the vines of the intervening country within the next two or three years.

DUTCH OR HOLSTEIN CATTLE.—The following article, written by Charles Mueller, esq., United States consul at Amsterdam, with a view to its publication in the reports of the Department of Agriculture, was communicated to the commissioner by J. E. Whiting, esq., of Concord, Massachusetts, to whom it was addressed:

"Dutch cattle—Holstein cattle—are they kindred or distinct breeds? If kindred, what qualities do they possess in common, and in what do they differ? If distinct, what are their respective merits and demerits?"

Questions of similar tenor have poured in upon this office from different parts of the Union in such profusion that I almost felt duty bound to prepare a reply somewhat exhaustive of the subject. I hereby submit it.

I do not claim originality for the production, it simply being a compilation of extracts from standard works, some of which might not be readily accessible to the American cattle-breeder, and of scraps of information gathered from the lips of different scientific and practical cattle-breeders of Holland. Of the latter, none but acknowledged authorities were consulted, many of the informants at this moment holding prominent and responsible positions in various Dutch agricultural societies.

In one of your letters you ask:

"Are, or are not, the general dairy-stock of Holland, including South as well as North Holland, Utrecht, and Gelderland, as well as Friesland and Groningen, commonly considered, in Holland, as of one race or breed?

"2. Are the cattle of any portion of Holland known or recognized as Holstein cattle, to distinguish them from cattle of other parts of Holland having a different origin; or have you in Holland a favorite breed presumed or believed to have originated in Holstein?"

Both questions have long since been definitely settled, historically as well as physiologically.

Historical authorities upon the subject are numerous, and they generally accept Dutch cattle as the parent stock of not only the present cattle of Holstein, but of many other well-known European breeds.

Extracts from all the works examined in furtherance of this communication would lead to too great voluminousness, for which reason only the more prominent authors are cited. As it is, it becomes necessary to go back some ways toward the days of Adam in order to gain a proper starting-point; and I hope your patience may be adequate to the tediousness of the perambulation.

Scientific farming flourished in the Netherlands* at a time when in other countries agriculture stood where the Roman invader had left it;† and there is every reason to believe that many appliances of modern farming were known to, and made use of by, the Dutch peasantry of remote days. At the agricultural museum of Utrecht may be seen machines handed down from immemorial times, which, beyond all doubt, served to facilitate the process of thrashing, mowing, and other agricultural operations. However, extended remarks upon this head would here be out of place. Moreover, through Mr. Motley's works on the Netherlands, the American reader has fully been made aware of the singularly high degree of Dutch agricultural advancement during the Middle Ages.

This glaring agricultural superiority of the Dutch could not, even at that period, remain unknown to other nations. As a natural consequence, foreign potentates and ecclesiastical magnates exerted themselves to secure the services of Dutch and Flemish farmers for their own selfish purposes—a development of agricultural resources necessarily increasing princely incomes and church-tithes. Thus Dutch settlers found their way to divers parts of Europe, taking with them their cattle and farming implements. It is, therefore, not surprising that such authorities as Professor Law, of Edinburgh, L. Raw, Arthur Young, and others, trace the descent of the celebrated "Shorthorns" of England to Holland.

Borchgrave‡ shows that as early as 1057 William Rufus, who had espoused a Flemish princess, called Dutch agriculturalists to England; and under his successor, Henry I, several Dutch settlements took life in Pembrokeshire, while a flourishing Dutch colony is reported in Yorkshire in 1111. In 1430 a large Dutch colony was founded in Scotland.§ The high estimation in which Dutch cattle must formerly have been held in England may be inferred from the fact that in 1601 the legislative assemblies of the provinces of Holland and West Friesland presented, through the agent Caron, as a valuable gift, six Dutch milch-cows to the lord high admiral of the British Empire.‖

The first Dutch colony in Germany (Thuringia) dates back as far as the year 528, and still recalls itself to mind by such names as the towns of Friesenfeld and Belge-

* The Netherlands as they formerly existed—the present kingdoms of Belgium and Holland.
† Meiner, Hist., vergl. II.
‡ Borchgrave, Emile de: Histoire des Colonies Belges.
§ Ibid.
‖ Koenen: Geschiedenis van den Boerenstand.

sheim.* From 801 to 864 St. Anskar, (Ansgar, Auscharius,) primate of Bremen, Hamburg, Holstein, &c., himself of Flemish birth, attracted many of his countrymen to those northern regions. Also Charlemagne colonized Flemish peasants on the shores of the Elbe.

That stretch of teeming lowlands east of Bremen to the Baltic wore a vastly different face in early days. Marshy and uncultivated, the coast-edge of those parts stood exposed to the tender mercies of the sea to such a degree that even a slight breeze would suffice to cause submersion; while the inhabitants, through intestine wars demoralized and habituated to strife and broils, evinced little aptitude for the peaceful pursuit of husbandry.† It was then that the attention of German princes was drawn to Holland, where similarly situated regions had been brought to a high state of productiveness. The great tide of emigration, however, did not set in until the twelfth and thirteenth centuries, from which period the origin of the fine grass-lands along the Elbe and Weser must be reckoned.

It was a mighty flow of emigration that wound its way toward those seemingly unfriendly shores, and to this day the peasantry of Holstein have preserved a Dutch ditty‡ which points to the east of Europe as the promised land, just as in our time the Great West of the American Union is the goal of the European emigrant. To conceive the extent of this wave of emigration, a look should be cast upon the map accompanying Borchgrave's work, from which it appears that Dutch settlers gradually spread as far south as Silesia, and even Austria.

In the year 1106 the bishop of Bremen ceded several districts of his possessions to Dutch settlers, with the understanding that all occurring marshes should be drained and converted into meadows, according to the Dutch method of reclaiming lands. Other ecclesiastical, as well as temporal princes, followed his example, and many similar cessions were made to Dutch settlers. It would be quite a task to recount all the charters thus granted; yet I cannot refrain from mentioning some which directly refer to Holstein.

St. Vicelin, having observed how the marshy lowlands near Bremen speedily assumed the character of luxuriant pastures, was the first ruler of Holstein who resolved upon giving his country the benefit of Dutch agricultural science; and to him and his successors that principality is indebted for the great transformation it underwent in the twelfth century. Three districts—Welster, Stor, and Helmshoen—received large Dutch settlements under Adalberon's charter of August 27, 1139, the same containing the proviso that the clergy of said districts should be entitled to harvest and cattle tithes upon the lands of Dutch settlers. This prince, July 25, 1144, further ceded a tract of land to Dutch emigrants in the district of Elmshorn. On January 10, 1221, Albert d'Orlamunde transferred to Dutch emigrants that range of lands situated between the settlements of the Saxons and the Dutch, known as the Vetus Terra. Here it may be mentioned that in 1470 Charles I, King of Denmark, abolished the Dutch land-laws then still prevailing in the districts of Welster and Kempermarsh. There is yet extant a deed of conveyance, in the Dutch language, dated 1340, relating to certain territories in the district of Stor, wherein the Dutch land-laws, then in force, are spoken of. Christiani, Holstein's historian, states that, as regards Holstein, at no time is mention made of other than Dutch colonists, and that Dutch emigration may be said to have commenced in the year 1120. The Count of Holstein personally undertook a journey to Holland, returning with colonists who settled in Wagria. The historian Helmold, in speaking of this colony, admits its importance by stating that it was reported to have consisted of 400 families, but that the number of Dutch settlers in Wagria might safely be taken at 8,000. In 1516 Christian II introduced Dutch settlers on the island of Amack, who soon transformed that waste into a perfect garden-spot. The inhabitants of to-day have preserved their original language, costumes, and habits, and number about five thousand souls. There can be no doubt of the Dutch land-laws having prevailed in Holstein from the emigration period down to the close of the fifteenth century. They were known in Germany under the name of "Hollandereien," (Hollandized lands.) In the present acceptation of the term, however, "Hollandereien" simply means dairy-farms—in itself proof that the Germans consider themselves disciples of the Dutch in this branch of farming.§

Yet enough of historical citations. If they have been introduced rather freely, it was for the purpose of *historically* establishing the fact that Dutch cattle did not originate in Holstein, but that on the contrary Holstein is indebted to Holland for any superior dairy-stock she may possess.

Whoever visits Holstein cannot help being struck with the Dutch aspect of the country, the prosperity of her farming community offering a strong contrast to the generally wretched condition of the German peasant. It is true a German author sought to disprove the assertion of German agriculture having materially been influenced by Dutch colonization. But Borchgrave, it may be safe to say, has effectually disposed of this point of controversy. Probably no author ever will attempt to refute his arguments.

I now proceed to examine the subject in hand physiologically. Quite a number of

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* Borchgrave. † Ibid. ‡ Ibid. § Wersebe II.

authorities have been searched in this connection, yet the gist of my remarks has been taken from Professor Hengeveld's* great work on cattle.

Although the human family is composed of many distinct races, physiologists have reduced them to five representative types, the Caucasian race taking first rank. It has preserved its distinguishing characteristics through all ages, no matter what changes, climatical influence, or industrial pursuit may have wrought upon one or the other of its branches.

In this sense Dutch cattle may be called, and in fact are admitted to be, the type of all the different breeds of cattle of Northwestern Europe, and especially of the North Sea and Baltic regions, such as Normandy, Flanders, Denmark, Sleswick-Holstein, Mecklenburg, Pomerania, as far as Dantzic, and the islands of Guernsey, Jersey, and Alderney. The cattle of Hanover, Oldenburg, the Nether-Rhine, and Belgium also must be classed here.

The different cattle-breeds of all these countries, whether of larger or smaller size, whether lighter or heavier, superior or inferior as milkers or beef-cattle, possess the distinguishing characteristics of the cattle of the Lowlands, of which the cattle of Holland are the type. Neither artificial nor natural influences have caused any remarkable degree of outward or physiological changes with any of them.

As a sufficient evidence of the high estimation in which Dutch cattle are held by breeders, the increasing exportation of breeding stock to all parts of Europe may be mentioned. Nor is this exportation of recent date. Buffon relates that Dutch milch-cows were successfully transplanted to Poitou, Aunis, and the marshes of Charente, where they are called Flemish cattle. Villeroy makes the same statement, adding, however, that in the valley d'Auge (Normandy) they are known under the name of Dutch cattle. Weckherlin does not rate Dutch cattle as high for their fattening propensities as he does for their milk-yielding qualities. But it must not be forgotten that the present improved heavy English breeds are of Friesish origin, and that the cattle of d'Auge are chiefly renowned for the enormous weight attained by them.

Although Dutch cattle are of one common race, yet there are many varieties, in time produced through the influences of climate and soil, the greater or less degree of fertility of the latter particularly affecting the animal in its development. Thus the Dutch farmer talks of clay cattle, marsh cattle, sandy-soil cattle, and heath cattle.

And now the question, What are the distinguishing qualities of Dutch cattle?

1. Their milk-yielding properties, in which respect they surpass all other known breeds of cattle. Formerly the average yield of a Dutch cow has been 3,000 Dutch cans† of milk per annum. At the present day it cannot be rated at over 2,850 cans. This decrease in milk-supply is not owing to a deterioration of race, but to the bad practice of overfeeding the calves, a habit which the Dutch dairyman follows in imitation of the example set by his ancestors, and which is carried to the extreme.

In the nature of animals it is a fixed law that food, over and above what is required for sustenance and growth, seeks an outlet, thereby more than ordinarily developing one or the other function of the animal organism. With cattle this surplus may take the shape of fat or meat. A calf receiving more food than is required for its sustenance and development must necessarily grow fat, the milk-channels not yet being opened. In this manner a tendency for accumulating fat is created in the young organism at the expense of the milk-yielding properties. On the other hand, let the young animal be sparingly fed up to its first and timely calving, subsequently to be put on a more liberal supply of food, and the foundation for a large milk-supply is laid. Professor Hengeveld considers calving in the early part of the animal's life, together with spare feeding prior to that period, one of the chief conditions of breeding good milkers; because by that process, ere the animal is yet fully developed, the milk-producing organs are early exercised and enlarged by an increased supply of blood; in other words, a good udder is attained.

2. A further physiological quality of Dutch cattle is their capacity for fattening. It is true, they do not attain the enormous weight of some English breeds; however, this fact is entirely owing to the mode of breeding adopted by the Dutch breeder, who prefers good dairy-stock to heavy beef-cattle.

About a century ago prize oxen weighed 3,000 pounds, prize cows 1,200 to 1,500 pounds. At the agricultural fair of Groningen, 1849, there was on exhibition a four-year old cow weighing 2,000 pounds. It is beyond doubt that Dutch cattle, and on their own native soil too, can be brought to as great a weight as the English and Swiss heavy breeds, while it is generally acknowledged that the meat of Dutch cattle is more palatable than that of the so-called fat races.

3. Another characteristic quality of Dutch cattle consists in their capacity of bringing forth large and powerful calves which are easily fattened. There are instances on record that fattened calves reached 400 old Dutch pounds, dressed weight. Their bulk and vigor endow them with considerable power of endurance, and to this peculiarity

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* G. J. Hengeveld, at this moment professor at the Veterinary College of Utrecht.
† A gallon equal to 4.5435 Dutch cans.

it is partly to be attributed that the future milch-cow matures and prospers in spite of the great hardships Dutch cattle are subjected to. They are turned out early in the spring, and remain in the field until late in the fall, without once tasting the luxury of stabling. And in a climate like that of Holland this is no trifling matter.

Here the report of the Paris (1856) International Fair may be referred to, wherein it is maintained that Dutch cattle, with proper treatment and breeding, can rival the best and noblest cattle-breeds of Europe, irrespective of their qualities as milkers.

4. As the last quality peculiar to Dutch cattle, their stability of race must be named. Artificial as well as natural influences brought to bear upon them during centuries, the former with a view to milk-supply, have given them a constancy of outward form and physiological characteristics, to such a degree that the same can be traced even after many years of propagation upon foreign soil, as, for instance, in England, Normandy, Bavaria, and the Weichsel.

The defects of Dutch cattle are few, and confine themselves exclusively to the outward form. Dutch cattle lack symmetry of form when compared with some cattle-breeds of other countries. Even the several varieties of Dutch cattle, when compared with each other, differ in the outward form. One is bony, coarse, and angular, while another is, to a degree, smooth and finely built. Yet all possess the one fault in common, *i. e.*, disproportion between the bone and soft parts, the former being in excess, so that even in fattened animals a certain degree of boniness can be observed.

It may also be said that, as a general thing, they are provided with too long and too heavy a head in comparison to the length and volume of the body. They are further frequently too long in the leg, and in but few instances are they well developed about the chest. Yet these shortcomings are the natural result of the simple way of keeping, and of the mode of breeding.

Butter and milk are the chief products of the Dutch farmer. For centuries past he has, in breeding cattle, aimed at a plentiful milk-supply. To obtain this a large udder is required. Now, by continually exciting and early exercising the milk-secreting organ, its development is aided; and as the udder belongs to the genitals, a free supply of blood is necessarily imparted to the balance of the generative organs. In consequence, the hind part of the body receives more blood than the fore part during the period of development, a circumstance which physiologically explains the phenomenon of Dutch cattle, as a rule, showing light fore parts, but well developed hind parts. Particularly is this the case with the most celebrated cattle of Holland, those of the Beemster and Drechterland. Upon these animals the "milk form" has been ingrafted to a higher degree than upon any other breed of cattle known. Nowhere can be found cattle with broader and more prominent hips and hip-bones, while, in consequence of this extraordinary development of the hind parts, the fore parts remain light, letting the fore legs appear high, the chest does not attain sufficient depth, and the shoulders present a bony aspect. This bodily structure, the result of breeding, must be accepted as peculiar to all Dutch cattle. Scientific breeding can easily remove these defects.

As to the question, "whether Dutch dairymen give universal preference to black and white cattle for dairy purposes, or whether this preference is based upon mere fancy," I must answer that the latter is unquestionably the case.

With the great majority of Dutch dairymen, this preference for black and white cattle does exist, although I have met some of the heaviest breeders of the Beemster, Purmer, and of other parts of Holland, who prefer red and white, others silver-gray. In Friesland, the prejudice against red, gray, and white cattle is great. There rarely any other color than black and white is found. But when asked why he prefers black and white, the Friesländer is unable to advance any satisfactory reasons. Some, indeed, contend that red and white cattle attract the heat too much, thereby impairing the quality of milk. However, this assertion being so palpably against all teachings of science, refutation would be superfluous. Dutch scientific agriculturists unanimously agree that this preference for black and white cattle is a mere fancy, handed down from father to son, just as the Dutch farmer prefers a black coat to a red one. In nowise whatever does the black and white color indicate superiority of race.

I must here touch upon the prevailing and erroneous notion of one or the other strain of Dutch cattle being mongrel Holstein breeds. There is no such thing known in Holland. It has been clearly shown that Holstein cattle are the distant but direct offspring of Dutch dairy-stock, and as such approach the latter nearer than any other breed of cattle. Yet, in milk-supply, they are by no means equal. That the Germans entertain the same opinion is evidenced by their heavy importation of Dutch cattle for the purpose of improving their dairy-stock. Dutch cows and choice bulls have of late been shipped to Germany in such large numbers that high Dutch officials, I understand, contemplate the enactment of prohibitory measures against that class of exportations.

Professor Hengeveld has specially been written to upon the subject of Dutch cattle and Holstein cattle. The learned author kindly replied, and I herewith subjoin a translation of his remarks. He says:

"The cattle of the Beemster and Drechterland are not only the best dairy-stock in

the Netherlands, but, as milkers, surpass any breed of cattle in Europe, the celebrated Swiss stock of Bern and Saône not excepted. Necessarily it follows that they are to be preferred to the Holstein, Oldenburg, Breitenburg, and all other so-called marsh or polder breeds of those countries. They yield more abundantly, and their milk is of a richer quality, while, as beef-cattle, they show a less angular frame and finer tissues.

"When transferred to Dutch pastures, the above-named polder breeds improve wonderfully in every respect, although they never equal the native stock either as beef-cattle, or milkers. I may here add that, in former days, the Northmen were in the habit of shipping cattle from the marshes to the rich meadows of Holland for fattening purposes, but at no time did importations take place with a view to the improvement of Dutch stock."

At the present day, cattle importations from those countries to Holland are of rare occurrence. Now and then the Dutch farmer, in order to supply the increasing demand for cattle, effects a foreign purchase; but that he considers the imported inferior to the native stock is evident from the fact that he brings the former to market in preference to the latter. The English demand for Dutch beef-cattle is very heavy.

Of Holstein and Schleswick cattle there are many varieties, how many would be difficult to determine, their distinguishing qualities, as in Holland, depending on the circumstance whether they are bred on the lowlands or on the higher sections of the country. The original lowland breeds, however, have much in common with Dutch cattle as found in the provinces of North Holland and Friesland. The prevailing color of Schleswick cattle is red and white.

Of late *pure* Holstein and Schleswick breeds are more rarely to be found. To improve their natural coarseness of frame, ruggedness and boniness, in short, to enhance their value as beef-cattle, they have within the last twenty years been largely crossed with Durham stock, the massive fat and flesh layers of the latter, and the heavy, broad hind quarters of the former, offering the required elements for such improvement. The crosses thus obtained mature earlier, but generally lose about 30 per cent. in the yield of milk.

In conclusion, permit me to add a description of what a Dutch farmer would call a "*beste koe*," (best cow.) It presents, if such a term may be used in this connection, the Dutch *beau-ideal* of a cow, and I am indebted for it to Mr. W. Sluis, one of the best-informed cattle-breeders of the Beemster:

"A '*beste koe*' must show a finely molded head; large nostrils; thin, transparent horns; a clear, bright eye; thin, large, and not excessively wrinkled eyelids; rose-colored inner membranes of the eye; purely red lachrymal glands; a kind, mild countenance; blue nose; thin neck; free respiration; fine bones; well-formed body, with rather broad hind parts; straight back; long, thin tail; round but moderately bent ribs; developed belly; stout, yet not heavy legs; smooth joints, thin, mellow, movable skin; soft hair; delicately haired broad and drooping udder; four well-formed, dark-colored teats; well-developed milk and blood vessels; vessels on the belly and about the udder to be proportionately broad and vigorous, and of a wen-like swell, and the vessels of the udder and inner hams to spread net-like, the openings through which the milk and blood vessels enter the body to be large and roomy. A cow thus formed is also apt to show a perfect escutcheon."

From Mr. Sluis I also learned why the Dutch farmer prefers black and white to white and black cattle, namely, because it is the general belief that cattle with too much white about them do not endure cold as well as those with which black is the predominating color. As another Dutch notion, I may mention the prejudice entertained against bulls that carry black spots on the pouch, or on the hocks. I failed to be enlightened as to the reason of this prejudice, although at cattle-exhibitions it happened that otherwise unobjectionable animals were rejected by the judges on this account.

And now I bid farewell to the subject. Enough, I trust, has been said in the foregoing pages to assign the proper places, in the world of cattle, to Dutch and Holstein dairy-stock. If my remarks may guide one or the other of American cattle-breeders in the selection of imported dairy-stock, I have not labored in vain.

UNITED STATES CONSULATE, *Amsterdam, August* 9, 1872.

EPIZOOTIC CATARRH.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., February 13, 1873.

SIR: I have the honor to inclose a copy of a memoir of M. Decroix, veterinary-surgeon, barracks of the Celestins, Paris, on the "epizootic catarrh," or distemper, prevailing among the horses of the United States, the original of the treatise having been transmitted to the Honorable Secretary of War, by Wickham Hoffman, esq., of the United States legation at Paris.

The memoir is sent to you with a view to the publication, in your Department report, of such portions as you may deem of sufficient interest and value to agriculturists and stock-raisers, for the benefit of whom, in particular, your report is published.

The receipt of the treatise will be acknowledged by the War Department, and such printed information relative to the disease as can be obtained will be transmitted to M. Decroix in return.

If the files of your office contain any special information on the subject, it is respectfully requested that the same be furnished this Office, in order that it may be communicated to M. Decroix, in care of United States legation at Paris, with the reply of the Honorable Secretary of War.

I am, sir, very respectfully, your obedient servant,

M. C. MEIGS,
Quartermaster-General, Brevet Major-General, U. S. A.

Hon. FREDERICK WATTS,
Commissioner of Agriculture, Washington, D. C.

PARIS, *November* 19, 1872.

SIR: For some time the American and English journals have announced that a serious epizootic has attacked a great number of horses in North America. No scientific description of the malady has yet come to my knowledge; but the symptoms that have been mentioned in the articles that I have read cause me to think that this distemper may be of the same nature as that which severely visited a very large number of the civil and military horses of France during the year 1871.

Supposing this to be the case, I feel it to be a duty and a pleasure, sir, to address to you a succinct account of the distemper that I have treated in my regiment, in order that, if you think proper, it may be transmitted to your Government, for the information of your fellow-citizens.

Will you accept, sir, the expression of my respectful sentiments.

E. DECROIX.

To the UNITED STATES MINISTER at Paris.

HORSE TYPHOID-FEVER, OR GASTRO-INFLAMMATORY EPIZOOTIC.

This malady presents itself under the epizootic form at intervals of ten, fifteen, and twenty years, and attacks great numbers of animals over a vast extent of country.

Principal symptoms.—The affection usually begins by sluggishness, inappetency, drowsiness, and a swelling of the eyelids. Among one-half of the horses attacked the malady has a mild form, and disappears in a few days by a purgative and laxative treatment and a dietetic regimen. When the malady is aggravated, from the second day the mouth is hot and clammy, the respiration and pulsations are accelerated, the mucuses ejected are of a reddish-yellow color, sometimes veined with small red pestilential spots. The gait is stumbling, the loins do not yield to pinching, the hair is easily pulled out, and the skin is sometimes hot, at other times cold. The limbs swell, the posterior members sometimes becoming enormous. The horses are very thirsty, especi-

ally during the summer season. The excrements are often covered with a bed of mucus, in a brownish, infectious liquid. Among some subjects the gastro-intestinal irritation determines a mild colic. Most frequently the thoracic organs are the most severely attacked; the lungs are congested and become more and more inflamed. The pleura secretes a superabundance of water; the pulse is irregular, increasing from 60 to 70; the beatings of the heart are not always very strong, and the metallic sound is rare.

The blood collected in a gauge is black. The separation of the white and black clots of blood is effected in the usual limit of time. The consistency of both is almost healthy. The white clots are smaller than those in the normal state, and are rose-tinted, or sometimes lead-colored. This color is also to be remarked in the serum, the proportion of which does not appear to be the same as in the healthy state. When a cure is performed the symptoms gradually, but slowly, disappear.

In some cases there is a relapse, and then the issue of the distemper is almost always fatal. Cases of passive foundering, of persistent running at the nose, or of rapid emaciation and a return of appetite often predict the glanders, which generally appears in the *ange*, between the lower jaws, by numerous large abscesses. In an unfortunate case respiration becomes more and more difficult the animal falls, struggles a little, and dies. Among certain animals death is preceded for twenty or thirty hours by a weakness of the limbs, which cannot sustain the body, being in a kind of paralytic condition. In the *fulminant* cases the subject appears scarcely indisposed, suddenly falls, and dies in five or ten minutes.

Lesions.—Discolorations and friability of the muscular system; infiltration of the cellular tissue of the limbs, most frequently of the posterior members, sometimes of the lips. Effusion of three or four pints of clear red water in the abdomen. The peritoneum of similar color to the water. The mucus of the small intestine usually of a bright red color, thick, and covered with yellowish, bloody mucuses. The *plaques* of Peyer and the follicles of Brunner (small glands of the intestine) participate in these changes. The mucus of the large intestine is sometimes of a greenish gray or a light slate color. It is easily removed, and in certain cases it presents a dotting of small, scarcely perceptible, ulcerations, especially in the cœcum. The liver is friable and discolored. The mesenteric ganglions are black and congested.

The breast contains from six to ten pints of a reddish, sanguineous water, without albuminous deposits or spurious membranes. The lower portion of one or both lungs is hepatized, like the tissue of the liver, and veined with yellowish albuminous deposits. The pericardium contains from three to five deciliters (.176 of a pint) of water, usually clearer than that in the breast. The intensity and extent of the lesions of the intestines and lungs vary according to the mildness or severity of the affection, the abdominal form or the pectoral, and the more or less rapid progress of the malady. The heart is discolored and friable, as though partly cooked. It presents small, pestilential spots, principally near the fissures, (near the great vessels.) The blood inclosed in the right cavities of the heart, and in the large veinous trunks, is black, pitchy, and incompletely coagulated. The left ventricle incloses a black and white clot. The brain and its envelopes are strongly injected, but there is no notable change in the consistency of the white or gray substances. The other lesions are neither characteristic nor certain, and are of a secondary order.

Denomination.—By the preceding symptoms and lesions the typhoid or gastro-inflammatory, epizootic affection may be easily recognized. In 1825 this distemper visited France with similar ravages to those produced by the epizootic of the United States.

Causes of the malady.—The epizootic attacks old as well as young horses, although the latter, especially if they are fat, may be more proof against it; it spares neither those that labor nor those that repose; those who may be quartered in good or bad stables, or even in the open air. The animals who have eaten the grass of spring, and those who have been deprived of it, cannot escape this distemper. Neither water nor forage can be considered as the cause of the malady. The epizootic appears in consequence of a medical atmospheric constitution that we believe is unknown in its essence, and that disappears after four or five months like the small-pox, cholera, and all other epidemics or epizootics.

Under the influence of this medical constitution, the small sores, the stamping and pulling at the halter, are followed by a considerable swelling. The abscess, when it is formed during the course of the malady, especially when in the lower jaw, suppurates but little in proportion to its size.

Contagion.—In the epizootic distemper that I have had to combat with I have not been able to establish a clear case of contagion. But there are veterinary physicians who pretend to have observed very positive instances of contagion. It is still, however, a matter of doubt; it is always best to separate sick animals, no matter what the malady, from the healthy ones, and this course is more emphatically a proper one in a case of epizootic.

As a disinfectant, chloride of lime possesses very unreliable qualities; *phenique* (car-

bolic) acid, ten grams to a pint of water, is preferable. The best disinfectant, in my opinion, is boiling water thrown upon the racks, mangers, soil, and walls.

Inoculation has been tested, but the result has always been negative; so that if the malady is contagious, it is by way of infection, and not by the transmission of a fixed virus.

Nature and seat of the distemper.—The blood always changes, loses its plasticity, and often filters through the walls of the vessels in order to form, in grave cases, the engorgement of the ecchymosis, or to mingle with the urine, excrements, and native mucus. Here we encounter in greater abundance than in the normal state the elements of bile, the liver being almost always diseased. The fatigues and privations of war do not suffice to account for the malady; the fresh horses having been attacked as the others. The blood being changed, all the organs are more or less affected by it; but the pectoral organs are more frequently and more gravely attacked.

Preventive means.—Avoid as much as possible the contact of the healthy and diseased horses. In the localities where the malady prevails, it is necessary to strengthen the thin, debilitated subjects by tonic powders—gentian powder, quinine, or oak-bark, about 2 ounces a day; on the contrary, it is necessary to administer to the fat, plethoric subjects 2 or 3 ounces of the sulphate of soda, each day, for five or six days. The stables should be kept very clean and well-aired, even when the weather is cold. It is better to leave the horses in the open air or under sheds, than to keep them in badly-ventilated stables. If wearied by excess of labor, make no notable change in their habits.

Treatment.—It is necessary to watch the horses in order to apply the treatment at the outset. The following means have proved most successful with me: First. Between morning and evening an ounce of the essence of turpentine incorporated in a tonic powder; Peruvian bark, gentian, and honey in sufficient quantities to make an electuary. Second. A large sinapism on the breast and abdomen; sometimes the swelling that this provokes is very considerable and spreads rapidly around the poultice; it is then necessary to make incisions, which are cauterized. It is not important to bleed any but the plethoric horses, whose pulses are strong and whose arteries are firm; and then the bleeding should be very moderate; about six pounds, according to the condition of the subject.

Setons may not take the place of sinapisms, as their action is too tardy, but, when the sinapisms do not arrest the progress of the malady, setons, two on each side of the breast, may be useful. If they do not suppurate apply fly-blisters to the flanks, when the abdominal organs are the most severely attacked. In very serious cases, where there are nervous symptoms, as in paralysis, profound coma, or a fit of vertigo, it is important to apply blisters to each side of the neck, upon the loins and breeches. In this case it is necessary to place upon the head a linen or sponge always kept moistened with fresh water.

When colic is consequent to abdominal irritation, the essence of turpentine should be replaced by acetate of ammonia in the electuaries. When there is a fit of coughing and the bronchia is seriously inflamed, the tonic powders and astringents of which we have spoken should be replaced by kermes-mineral and a few grams of laudanum. These medicaments should be employed until there is a notable improvement.

Whatever may be the form of the malady, injections, two or three per day, should be administered.

During the epizootic of 1871, I tested different medicines, phosphoric oil, for instance, in the nervous (siderale) form of the disease, but I obtained no good results. With the *phenique* acid and sulphate of iron the success was doubtful.

Mons. Salle, a military veterinary surgeon, is said to have obtained great success with aloes. I have never tried them and cannot pronounce upon them.

I shall not mention all the secondary means, that should be varied according to the age, temperament, and condition of the patient, and that every veterinary physician who is near the sick horses can best appreciate.

Regimen.—During the acute period the sick horses should always have before them clean water, (a little meal in the water,) into which may be thrown a handful of the sulphate of soda; in case of the swelling of the limbs, the sulphate of soda may be replaced by salts of niter. It is important to give the diseased horses straw of good quality and barley or oat-meal. Carrots are good. As soon as the appetite returns the nourishment must be more substantial; good hay and oats, a little at a time, but frequently, the quantity to be progressively increased. Walking should not be forbidden unless the horse is absolutely unable to walk. The horses should be well groomed and the limbs rubbed vigorously, in order to restore circulation and warmth.

Complications.—When the distemper is serious, it produces a profound change in the whole organism; convalescence is long, and during this period there sometimes appears an inflammation of the synovial membrane of the fetlock-joints, (the treatment of which is known,) but what is more to be dreaded is the appearance of the glanders. In view of this, the horses should be carefully inspected.

I am convinced that, connected with the American epizootic, whatever may have

been its actual character, there were more glandered horses than in ordinary years. It is therefore necessary to guard against that disease by slaughtering the animals as promptly as possible in order to avoid contagion.

Number of horses attacked.

Effective number	612
Number of horses attacked so seriously as to be sent to the infirmary	165
Number cured	144
Number died	21
Number lightly attacked and put upon a proper regimen, in stable, about	100
Total attacked	265

In many other localities the proportion was about the same.

Duration.—The epizootic began about the 1st of June, was at its height at the beginning of July, and disappeared at the end of September.

The duration for each horse was variable; ten or twelve days in mild cases, and thirty or forty days in serious cases. Where the issue was fatal, death usually occurred from the seventh to the ninth day, sometimes much sooner in fulminant cases, and later in cases of complications.

Such, Mr. Ambassador, is the relation that, in the interest of your fellow-citizens, I believe it to be my duty to request you to make known to your Government. If you should desire further information I should be happy to communicate it to you.

I should be pleased if, in return, you would procure an account of the distemper from some American professional veterinary-surgeon, and transmit to me a copy.

E. DECROIX,
Veterinary-Surgeon in Chief to the Republican Guard.
Barracks of the Celestins, Paris.

FISH-CULTURE.

The following communication has been received by the Commissioner from Hon. Robert B. Roosevelt, of New York City:

SIR: Now that the artificial production and cultivation of fish has taken an established position among the industries of the world, and especially of this nation, a thorough investigation of its fundamental principles is a matter of public interest. That it has passed from the realm of theory and empiricism into that of permanence and success is well proved by the existence of numerous fish-breeding establishments carried on for profit, and the creation of fishery-commissions by the legislatures of most of the older States of the Union. It is true that the principal varieties of the inhabitants of the aqueous element cannot be "cabined, cribbed, confined," cannot become the subjects of special property, and must be allowed to roam from one spot to another, passing under different legal, without actually coming within any permanent, jurisdictions. But at least one sort of fish has become a merchantable commodity, and is bred, raised, and sold precisely as sheep or cows or horses are bred, raised, and sold, and has a fixed marketable value, with a demand generally exceeding the supply. There are not less than fifty professional breeders of trout in this country, all making a living mainly or wholly from this employment, and several receiving large incomes. They keep mature fish in restricted and controllable limits, supervise their gestation and parturition, attend to the proper impregnation of the eggs by natural or artificial means, protect and guard the ova while hatching, assist the young when first born, and when encumbered with the umbilical sac they are unable to take care of themselves, and finally feed them when the time arrives for them to receive nourishment, until they can be distributed in the localities where they are needed. This is no temporary or fanciful occupation, but a regular business. So with the public attempts to increase the supply of those sorts of fish which inhabit large rivers and lakes, and may be taken by any member of the community, or a number of different proprietors of fishing-rights, or which are anadromous and yearly descend into the ocean, the common property of the world. These efforts, under the legislative encouragement of the several States, have been uniformly successful to a degree fully commensurate with the time and money expended, and have entirely established the proposition that fish can be cultivated as easily and profitably—it might seem hyperbolus to say more so—as grain, fruits, or vegetables. As an instance of this, reference can be made to the Connecticut, in which

some thirty millions of young shad were artificially hatched in the year 1868, and, as a consequence, the yield at the proper time was made larger than it had been since 1802; or to the Hudson, in which ten millions of the same fish are hatched yearly, and the fishery is being rapidly restored, although it had run down until it was on the point of being abandoned.

There are three facts which at once arrest the attention of the investigator into the art of pisciculture. In the first place, he finds that vast tracts of water are either almost depopulated or wholly bare of fish; not a reader of these words but can mention a dozen ponds or brooks which are simply stripped of all edible living creatures, while in other rivers or lakes the fishing has become so poor that it cannot be profitably followed for its yield, and is abandoned as a source of amusement. And yet the experience of older countries and the evidence of experts prove that an acre of water can be made far more remunerative than an acre of land. Were a similar number of miles square of valuable land equally neglected public attention would be aroused and statesmen would be investigating the causes of such an anomaly. In a portion of France crops of grain or grass are regularly alternated with crops of fish—such as eels—and the latter are altogether the most remunerative, and yet in this country the nation's boundless heritage of water is left unimproved. Instead of increased development fisheries are being everywhere exhausted and waters everywhere depopulated. Efforts are put forth on all hands to make two blades of grass grow where one grew before, and the successful inventor is called a public benefactor, while ignorance, neglect, and perversity are permitted to destroy a supply of food but little, if any, less important than the most valuable single production of the earth. Many of these streams at present deserted were once teeming with life. When Hendrich Hudson first ascended the river called by his name, the shad, which he mistook for salmon, were so numerous that he makes mention again and again of the "great stores of salmon" he encountered; and when the country was first settled every brook and rivulet could furnish in an hour its abundant meal of trout, bass, or perch. The rivers have not changed, the waters have not become unwholesome; except a few incidental localities where pernicious employments are carried on, fish could live, increase, and multiply, as freely and readily now as heretofore. Here is a fit object for the attention of the learned and the care of the law-maker. There is no better food than that of fish, and so long as the words "the poor ye have always with you," hold good, it is a duty to cultivate all the means of supporting human life that nature has placed within the reach of man. It is a sin to neglect the water while so many have all they can do to draw a meager living from the land.

The next point that the investigator will note with wonder is the almost infinite productiveness of fish. Maize yields its four or five hundred grains for one, wheat and oats far less, and other agricultural products in proportion, but the cod and herring lay millions of eggs each, while the shad and striped-bass, *Labrax lineatus*, produce as many hundreds of thousands. One of the least productive varieties is that of the *Salmonidæ*, and yet that contains two thousand eggs to every pound-weight of the parent; while the black-bass, *Grystes nigricans*, although comparatively not prolific, guards its eggs till they hatch and the young until they can care for themselves. This fecundity is startling and leads to curious conclusions. It had some wise purpose under the kind laws of the Creator of all things, and yet had it been unobstructed in its operations it would have brought about disastrous consequences. Had all the *ova* of the cod, and hake, and haddock hatched, the sea would have been a mass of fish, and foul with their putrefying carcasses; had there been no counterpoise, no compensating law of restraint, the pure element that is needed to sustain man's life would have been defiled and the human race could never have existed on this planet. But there were proper and effectual balance-wheels that entirely obviated such dangers. The enemies to young fish life are almost as numerous as the fish themselves; older fish feed on the *ova* and the fry, devouring both in incalculable numbers; bugs, *animacula*, the *pupæ* of water-flies and myriads of insects prey upon the immature spawn, while much of it gets covered with mud or silt, is never impregnated, or fails for one of a thousand reasons to hatch. So the yield is limited, and after it has reached a certain point never varies from that without some extraneous disturbing cause, a cause which usually comes from the interference of man. Were the human race extinct there would just be exactly so many fish in the seas and the lakes and the rivers, no more, no less, and rendered invariable by the unvarying law of variations, the unchanging rule of circumstances. So they are found to be in all new countries, and once were here. But man steps in, he takes the kinds he likes for food, he neglects the worthless and inedible, he pays no heed to minute enemies, and leaves the foes of the very sorts he appropriates to increase and multiply without limit. What is the result? Precisely what is seen in all the inland waters of this continent, and what will soon be apparent in the adjoining sea. The fish have disappeared, and their worthless foes either occupy their place or are themselves dying for want of food.

Thirdly, the investigator will observe that of all sorts of human food none is produced so cheaply as that of fish. It costs nothing for manure, it needs no tillage it

requires only the harvest, or, under artificial cultivation, the seed-time as well. The expense of the harvest, too, depends upon the amount of the yield; for, were fish as abundant as they should be, it would be but trifling. A shad, no longer than the first joint of one's little finger, and not much thicker than a pin, is turned loose in the head-waters of some river, feebly it floats toward the ocean with the current, feeding because it grows, but on food wholly invisible to the eye of man even assisted by the microscope of science. Slowly it is converting the worthless into the valuable. In a few months it is an active, vigorous little fish of three or four inches length. Then it adventures out into the ocean, the vast store-house of incalculable amounts of its food; *animalcula*, suspended in mud-water thick as motes in the sun's rays; *crustacea*, on the bottom, only less abundant than the grains of sand: and *conferræ*, floating about in masses an acre wide. It grows and grows, assimilating more valueless substances and turning them to man's service, and at last it returns, of full size, in splendid condition, fit for the fisherman's net, and worthy to grace the table of the epicure. It left its birth-place a poor, puny, worthless thing, of scarcely an appreciable weight; it returns a three or four or five pounds weight of edible delicacy, not to be surpassed in strength-giving or gastronomic qualities. It demands no care, and draws but little from the world's stock of food or food-making substances: the ox devours tons of grass, which has cost much labor and required valuable manure, ere he is fit for the butcher; but the shad prepares himself for the fisherman by his own exertions, and then comes voluntarily to the net when he is fit to kill. The warm-blooded animals are expensive to raise: they are active, full of motion and heat, and waste much of their food in assimilating the rest; but fish are cold blooded, dull, and quiet, rarely moving unless disturbed, and lying, hour after hour, in one position, unless tempted out to pounce upon their prey. They void but a trivial proportion of what they consume, and their active digestion quickly converts the greater part of it into their own flesh, yet medical investigations establish that fish-food is more nutritive than meat, and is especially adapted to the sustenance of the brain, marrow, and bones, as it contains large quantities of phosphorous. In every point of view, then, it is cheaper; and nature would seem to have expressly kept this reserve until the earth should be so crowded with people that man could no longer find in it a means of support, and should be forced to look for maintenance to the waters which once covered the world, and are still two-thirds of its extent. This provision seems doubly probable, when it is remembered that the principal dangers to fish-life exist in the ova state, and that it is in precisely that stage that man's assistance can be given and is of the greatest use.

UNITED STATES COMMISSION OF FISH AND FISHERIES.

Professor Spencer F. Baird, of the Smithsonian Institution, acting as Commissioner of Fish and Fisheries under act of Congress approved February 9, 1871, has made his first report, which has just been printed for general circulation. This report embraces his investigations concerning the condition of the sea-fisheries of the south coast of New England, in 1871 and 1872. It will be remembered that the act creating this commission was passed in view of the reiterated assertions that the most valuable food-fishes of the coast and the lakes of the United States were rapidly diminishing in number, "to the public injury, and so as to materially affect the interests of trade and commerce." The commissioner was charged with the duty of prosecuting his inquiries with reference to "ascertaining whether any, and what diminution in the number of the food-fishes of the coast and the lakes of the United States has taken place; and, if so, to what causes the same is due; and also whether any and what protective, prohibitory, or precautionary measures should be adopted in the premises."

It is a matter of surprise that, notwithstanding the material importance of the fisheries more immediately to the States along the coasts, and in full view of the fact that the fish-supply was becoming less reliable, and, indeed, in some localities failing almost entirely, no official investigation or inquiries were set on foot until as late as 1869–'70, when petitions aroused the attention of the legislatures of Massachusetts and Rhode Island. But the reports of committees of investigation were so utterly at variance as to conclusions and recommendations, that anything like harmony and concurrence of action through statistical regula-

tions was little to be hoped for. Not without reason, it was judged that the investigations of a scientific commission, acting under the authority of the General Government, and unembarrassed by local considerations, would carry weight, and its enlightened recommendations dispose those immediately concerned in the prosperity of the food-fisheries to co-operate readily in the plans proposed for their preservation and improvement.

Professor Baird began his investigations in the summer of 1871, at Wood's Hole, Massachusetts, where the large number of "pounds" afforded material for inquiry. Simultaneously, investigations were being made off the coast of North Carolina, under the direction of Dr. C. H. Yarwood, United States Army, and by a deputy commissioner whose operations were to be confined to the great lakes. The latter, during the season of 1871, visited every pound and gill-net station on Lake Michigan, collecting a body of valuable information which will appear in another report. Investigations, taking in a greater extension of sea-coast, were continued in 1872, and the present report has reference in its data and conclusions to the south side of New England, especially that portion of it extending from Point Judith on the west, to Monamoy Point on the east, including Narragansett Bay, Vineyard Sound, Buzzard's Bay, Martha's Vineyard, and Nantucket. In view of inquiries made upon these grounds, covering two seasons, Professor Baird has no hesitation in stating that the fact of an alarming decrease of the shore-fisheries has been clearly established by his own investigations, as well as by evidence of those whose testimony was taken upon the subject. He reviews in order and at length the reasons ascribed to account for the decrease which, as commonly given, are:

1. The decrease or disappearance of the food upon which the fish subsist, necessitating their departure to other localities.
2. A change of location, either entirely capricious or induced by the necessity of looking for food elsewhere, as just referred to.
3. Epidemic diseases, or peculiar atmospheric agencies, such as heat, cold, &c.
4. Destruction by other fishes.
5. The agencies of man; this being manifested either in the pollution of the water by the discharge into it of the refuse of manufactories, &c., or by excessive over-fishing, or the use of improper apparatus.

The validity of the assumption of a diminution of food is denied in the most positive terms. That change of abode on the part of the fishes as a cause of decrease has not been substantiated by facts. Where no positive cause for sudden disappearance of fish in quantity can be given it is often ascribed to diseases or to atmospheric agencies. The ravages of predaceous fishes, of the blue-fish particularly, are a leading cause of the diminution of the fish-catch. Of the blue-fish, Professor Baird ascertained by careful inquiry that about one million and a quarter could be estimated as the number captured in Vineyard Sound, and on the coast from Monamoy Point, through Long Island Sound, and sent to the market in 1871. Judging, from the character of the fish, that not one in a hundred is taken, he admits the presence in those waters of 100,000,000 blue-fish. Their habits show that they each destroy at least twenty young fish per day, thus showing an enormous aggregate destruction. He says:

We all know that fish-spawn and fish in different stages of growth constitute the principal source of food to other fishes in the sea, and that the great proportion of fishes devoured are of tender age. The blue-fish, however, will often attack species but little less than itself, and the 100,000,000 referred to probably destroy fishes of two or three ounces and upwards; that is to say, those that have passed the ordinary perils of

early life, and have a fair chance to reach maturity. Therefore, if 12,000,000,000 are eaten, the number destroyed off the New England coast in a season of one hundred and twenty to one hundred and fifty days can be easily estimated.

Notwithstanding this great destruction by the blue-fish, Professor Baird is confirmed in his impression, by careful observation, that to the concurrent action of man is due in larger proportion the decrease of fish, and in some grounds a danger of practical extermination. The tendency of the methods employed, in many cases, is obviously in the direction of a comparative diminution of fish-supplies. The general conclusions of Professor Baird, covering the results of two seasons of patient and pains-taking investigations, will be read with interest.

I. The alleged decrease in the number of food-fishes in these waters within the past few years has been fully substantiated.

II. The shore-fishes have been decreasing during the past twenty years, gradually at first, but much more abruptly from the year 1865; the reduction in the year 1871 being so great as entirely to prevent any successful summer-fishing with the hook and line, and leaving to the traps and pounds the burden of supplying the markets. This statement applies also, but perhaps to a certain extent, to the blue-fish. The decrease in their numbers first manifested itself about ten years ago, and is going on quite rapidly until now.

III. This period of decrease represents the time during which the traps and pounds have been well established, their operations increasing year by year, and their catch, especially in the early spring, being always very great.

IV. In 1871 and 1872 the decrease in the number of fish has been so great as to reduce very largely the profit formerly derived by the traps.

V. The appearance, in 1871, of an unusually large number of young fish spawned in 1870, is a phenomenon only to be explained by the probable escape of a larger number of breeding-fish than usual during the previous season, an abrupt decrease in the ravages of blue-fish and other species, or else by a spontaneous movement northward of newly-hatched fish that ordinarily would have remained on a more southern coast. While these fish will, probably, for several years, constitute a marked feature in the fisheries, there is no evidence of the existence of a second crop of young fish corresponding to the one in question.

VI. The decrease of the fish may be considered as due to the combined action of the fish-pounds or weirs, and the blue-fish; the former destroying a very large percentage of the spawning fish before they have deposited their eggs, and the latter devouring immense numbers of young fish after they have passed the ordinary perils of immaturity.

VII. There are no means at our command for destroying the blue-fish, nor would it be desirable to do this, in view of their value as an article of food. The alternative is to regulate the action of the pounds so as to prevent the destruction of fish during the spawning-season.

VIII. The quickest remedy would be the absolute abolition of the traps and pounds. This, however, would be a harsh measure, and their proper regulation will probably answer the purpose of restoring the supply, although a greater number of years will be required. Such regulation may consist either in prohibiting the use of traps or pounds during the entire season of the spawning of the fish, or for a certain number of days in each week during that season.

IX. As the principal profit of the pounds is derived from the catch of fish during the spawning-season, it will probably be sufficient to try the experiment of prohibition of the use of nets from Friday night until

Monday morning of each week of the spawning-season, and after that no restriction need be imposed.

X. It is desirable that the regulation for a close time during each week be passed by the several States; and if this cannot be effected, then the General Government should enact absolute prohibition, or at least during the spawning-season, as it possesses no officers who could exercise the supervision required to enforce the partial closure, or before whom complaints could be entered and the penalty exacted.

XI. Any marked increase in the number of the shore-fishes, resulting from their protection during the spawning-season, will probably tend to restore the blue-fish to their original numbers.

XII. As there is reason to believe that scup, and to a less degree other shore-fishes, as well as blue-fish, have several times disappeared at intervals to a greater or less extent, within the historic period of New England, we cannot be certain that the use of traps and pounds within the last ten years has actually produced the scarcity complained of. The fact, however, that these engines do destroy the spawning-fish in so great numbers renders it very probable that they exercise a decided influence. No vested interest or right will suffer by the experiment of regulating the period of their use, as we have attempted to show that a better price will be obtained from a smaller number of fish, by preventing the glutting of the market, and the consequent waste of so perishable an article as fresh fish.

XIII. A feeling of bitterness entertained by the line fisherman and the general public against traps and pounds, and those who own and profit by them, will, in a measure, be allayed if the experiment of regulation and restriction be tried, at least for a few years.

FOREIGN STATISTICS.

The following statements are from a translation of a recent report of the French minister of the interior:

CREATION OF A BUREAU OF STATISTICS IN AUSTRIA.—A new bureau, in the department of commerce, called the bureau of statistics, has been organized in Austria. The importance of the science of statistics is generally recognized. Austrian economists have long been pressing this matter upon the government and the public. Says the former minister of commerce, a well known economist, Doctor Schaeeffle, "Official statistics should be extended as a network of observations over the whole country, and consecrate its best efforts to the study of social movement." The new measure will fill a seriously felt blank. It is true there was in existence a central commission of statistics, but its labors wanted method and unity. Furthermore, its activity was limited to the interior, whereas comparative statistics is the only system of value or utility. The department of industrial statistics is entirely wanting in Austria, which is especially to be regretted at the opening of the universal exposition. The department of commercial statistics was better organized, but publications concerning it rarely appeared at useful periods, and were too tardily given to the public. Every three months the minister of commerce announced, in a weekly review, *The Austria*, the results of the commercial movement; the Central Commission of Statistics published annual reports. But sometimes these abstracts did not agree with each other. Unity of direction was manifestly deficient. The new organization takes cognizance of this difficulty.

Since 1864 a greater regularity is observable in this service. In the first half of the century, statistical tables, giving abstracts of commerce, were ordinarily published at intervals of about two and a half years or more; thus the commerce of 1842 was not officially known till October, 1845. Things have since changed, and the official table of 1870 was published in December, 1871, or about twelve months after the close of the year. This delay will be still further reduced under the new policy.

Another question should attract the attention of governments. Hitherto European governments have not adopted a uniform statistical system. Would it not be useful to adopt a common base of operations? It is only by unity of aim and effort that nations will make of statistics a practical science, securing a comparison between productive forces.

THE METRIC SYSTEM IN AUSTRIA.—A law of July 23, 1871, introduced the metric system into Austria. The standard of measure is a rod enclosed in glass in possession of the Austrian government, which, at the temperature of melting ice, is equal to 999.99764 millimeters of the prototype meter deposited at Paris. The standard of the kilogram is a kilogram of crystal, the weight of which, *in vacuo*, is equal to 999.9978 of the prototype kilograms of Paris. The new system of weights and measures will be used in trade after the 1st of January, 1873; it will be obligatory and exclusive after January 1, 1876. The weights and measures hitherto used in Austria will bear the following values in terms of the metric system:

Measures of length.—A toise of Vienna equals 1.896184 meters; a foot of Vienna, 0.316084 meter; an ell of Vienna, 0.777558 meter; one postal mile, 7.585936 meters; one span, 10.53602 centimeters.

Measures of surface.—A square myriameter equals 1.737727 square miles; a square toise, 3.596652 square meters; a square foot, 0.099907 square meter; a *joch* of Lower Austria, 57.51612 ares; an Austrian square mile, 0.5754642 myriameter.

Measures of capacity.—A cubic meter equals 0.146606 cubic toise; a cubic meter, 31.66695 cubic feet; a cubic toise, 6.820092 cubic meters; a cubic foot, 0.03157867 cubic meter.

Dry measures.—A hectoliter equals 1.626356 Viennese setiers; a liter, 0.01626365 Viennese setier; a Viennese setier, 0.6148682 hectoliter, or 61.48652 liters.

Liquid measures.—A hectoliter equals 1,767129 eimers; a liter, 0.070-68515 mass; a Viennese eimer, 0.565890 hectoliter; a Viennese mass, 1.414724 liters.

Measures of weight.—A kilogram equals 1 pound 25.0137 ounces; a decagram, 0.571367 Austrian ounce; a ton, 1,785.523 pounds; a kilogram, 2 pounds of the customs, or 2.380697 pounds, apothecaries' weight, or 3.562298 silver marks. A gram equals 0.286449 ducat of gold, or 4.855090 karats of Vienna, or 0.06 postal ounce. A Vienna pound equals 0.560060 kilogram. A quintal, 56.0060 kilograms; an ounce, 1.750187 decagrams; a quintal of the customs, 50 kilograms; a pound of the customs, 0.5 kilogram; a pound, apothecaries' weight, 0.420045 kilogram; a Vienna silver mark, 0.280668 kilogram; a gold ducat, 3.490896 grams; a Vienna karat, 0.205969 gram; a postal ounce, 16.666667 grams.

FOREIGN COMMERCE OF AUSTRIA.—During the semi-decade, 1867–'71, Austrian commerce was remarkably progressive. The course of business arrested by the military operations of 1866 was revived with new force. That year may be considered as the starting-point of an upward movement, the importance of which may be seen from the following figures: The total foreign trade of Austria, in 1871, amounted to 1,147-

218 florins, the Austrian florin being about equal to half an American dollar. Of this aggregate 583,540,000 florins represented the imports, and 561,678,000 florins the export trade. These amounts were nearly double those of 1866, of which the imports were 245,168 florins, the exports 380,406,000 florins, and the total 625,574,000 florins. The heavy balance of export trade gradually declined till in 1870 the surplus of imports amounted to nearly 50,000,000 florins, the import balance of 1871 being nearly 22,000,000. The specie movement of the semi-decade exhibits the same expansion. In 1866, the imports of precious metals amounted to 27,250,000 florins, and the exports to 50,937,000; during 1871 the imports were 59,803,000 florins, and the exports 63,108,000, showing a decided tendency toward equalization.

A more marked development is observable from 1867 to 1868 than in the following year. The reason of this difference is found in the exceptional export of Hungarian cereals during 1868, which was not maintained during 1869. Importation of rough metals was greatly extended during 1867, in consequence of the impulse given to railroads. A great part of the supply of 1869 was imported in 1868.

The imports of agricultural products and manufactures thereof during 1871 embraced the following, viz: Colonial and tropical products, 29,112,000 florins; tobacco, 13,256,000 florins; grains and fruits, 24,401,000 florins; animals, 20,173,000 florins; animal products, 18,700,000 florins; seeds and oils, 15,477,000 florins; liquors and provisions, 3,848,000 florins; textile materials, 112,357,000 florins; yarns, 39,929,000 florins; tissues of all sorts, 62,811,000 florins; leather and skins, 19,836,000 florins; total, 359,900,000 florins.

The exports of agricultural matter and its manufactures in 1871 embraced the following: Colonial and tropical produce, 26,340,000 florins; tobacco, 13,871,000 florins; grains and fruits, 86,815,000 florins; animals, 10,881,000 florins; animal products, 10,921,000 florins; seeds and oils, 7,757,000 florins; liquors and provisions, 6,483,000 florins; textile materials, 45,962,000 florins; yarn, 11,427,000 florins; tissues of all sorts, 61,327,000 florins; leather and skins, 18,996,000 florins; total, 300,240,000 florins. Nearly all these exports exhibit a marked increase since 1866. Less textile raw-material was exported, but the deficiency has been made good by the increased export of yarns and fabrics. This indicates a very healthy condition of textile industry, which is now working up an increased proportion of native raw-material. Colonial and tropical products manifest a marked increase of export.

DALMATIAN AGRICULTURE.—Dalmatia is an Austrian province stretching along the northeast coast of the Adriatic two hundred and nine miles, with a breadth varying from two to fifty miles. Its population numbers 220,169 males and 222,627 females; total, 442,796. The mass of the people are Serb-Croat, about 20,000 Italians being domiciled in the land. The dominant religion is Roman Catholic. The land-surface embraces 1,000,000 arpents of free pasture, 479,478 arpents of woodland, 200,000 arpents of vineyards, 22,264 arpents of meadows and gardens, 26,934 arpents of olive groves; the remainder of its agricultural area is devoted to cereal productions. The vine and the olive flourish along the coast when the thermometer does not fall below 5° (R.) below zero. The meadows and grain-fields occupy the higher lands, and extend back to the frontiers of Turkey.

SUGAR INDUSTRY IN AUSTRIA.—According to the latest reports, there are in Austria two hundred and thirty-six beet-sugar factories, of which one hundred and sixty are in Bohemia, forty-nine in Moravia, eleven in

Silesia, eight in Lower Austria, six in Gallicia, and two in Styria. Adding to these figures twenty-six factories in Hungary, and the total becomes two hundred and sixty-two. Of the above seven are exclusively refineries, and about two-fifths, or one hundred, are worked upon shares. Ten new factories are in process of construction. The number of factories in Austria increased in two years eighty-one, or 52 per cent.; in Hungary it remains stationary.

WOOL INDUSTRY IN HUNGARY—KINDS, QUALITIES, PRODUCTION.—Pesth is the center of the wool-trade of Hungary, with the exception of some western districts which export a portion of their products directly to Vienna. Hungarian wools, which are the basis of important transactions in the Pesth market, are of various sorts.

1. *Merinos*, which come mostly from the great basin of the Theiss. These merinos are of medium quality, and are divided into two distinct classes; *a*, fleeces shorn twice a year, in April and May and in August and September; *b*, fleeces shorn but once a year, some time in June.

2. Fleeces known as *Cigaja* and *Zakel*. These are produced by two other kinds of sheep found in Transylvania, in the Banat, and in Sclavonia. This wool is long, brilliant, and very harsh; its fibers attain a length of thirty centimeters. It is especially used as a combing wool, and for the fabrication of heavy tissues. Its range is entirely independent of that of the merinos.

3. Lastly, a fleece intermediate between the two preceding is furnished by a cross-bred sheep raised in Transylvania, the Banat, and Sclavonia.

Production.—Hungary produces about 20,000,000 kilograms of fleeces. The larger portion of the clip is sent to Pesth by traders, and not by producers, who are in the habit of selling their products in advance of shearing and of receiving a portion of the price at the conclusion of the bargain. The fleeces, washed before shearing, arrive at the market packed in sheets of rough canvas.

Business habits and usages of the Pesth bourse.—Transactions are usually for cash, with a discount of 2 per cent. Each contract, however, may vary its stipulations according to agreement. The seller promises to deliver his wool well washed. If for any cause the washing is imperfect he owes the purchaser an indemnity. The odds and ends are not packed with the fleeces, but receive the same price as the rest of the wool.

Frauds against which dealers must protect themselves.—These are principally of two sorts: first, they must ascertain whether the wool has been stored in cellars in order to enhance its weight; second, they must see that the staple is not charged with sand from the plains between Pesth and Szegedin. This sand is very heavy and very fine, disappearing only after the most thorough washing. Its presence is not appreciable to an inexperienced eye.

Channels of exportation.—The greater part of the wool marketed at Pesth, nearly 12,000,000 kilograms, is purchased by the cloth manufactures of Brun and Reichenberg. The combing wool mills of Wolsau and Pesth and the mills of Bohemia consume about 2,000,000 kilograms. During later years Hungary has been sending to France from 1,250,000 to 1,500,000 kilograms of combing wools, and from 500,000 to 750,000 kilograms of clothing wools per annum. Germany and England make about equal demands on the Pesth wool-market. Considerable importations from Australia and La Plata into England, and thence into continental Europe, have reduced the market-prices at Pesth, and foreign transactions have greatly declined. On the other hand, since the compro-

mise of 1866, the industrial movement has greatly progressed. The later yields have enabled Hungary to increase her demand for the manufactures of Europe, and to give the first impulse to her own wool industry.

Manufactories established at Pesth.—Two manufactories, placed in operation in 1869, present a special interest; of these one has for its principal aim to favor the exportation of wool by reducing its expense of transportation; the other is a real industrial establishment presenting a solid interest by its excellent installation, the goodness of its fabrics, and the financial results already achieved.

The first is known under the name of the *Wollwasch-Fabrik*. It receives wool in grease directly from producers, which it sorts, washes, and sells on account of the proprietors, charging a certain price for handling and small commission. It is at once an industrial and a commercial house. This combination reduces the expense of transport 70 per cent. The *Wollwasch Fabrik* can wash 1,300,000 kilograms of wools per annum. Unfortunately only wools of medium quality can be economically subjected to this mechanical washing; the alkalies employed in washing and the mechanical processes to some extent knot and felt the fiber.

The second, known as the *Erste Ungarische Kammgarn-Spinnerei Gesellschaft*, is a complete establishment, embracing apparatus for washing, carding, combing, spinning, twisting and even a dye-works which can color the most diverse shades, to the extent of 1,000 kilograms of yarn per day. A weaving-factory has been added, which already contains fifty cashmere looms. A capital of 600,000 florins, (about $300,000,) divided into 3,000 shares of 200 florins ($100) each, under the skillful and conscientious direction of a Frenchman, M. Émile Lepaulle, an old pupil of the *École des arts et des métiers*, of Chalons, is sufficient for all the purposes of purchase of ground, construction, and installation. With the exceptions of the motive-powers and the transmissions of movements, all the apparatus, assortments of cards, automatic spinning-jennies, apparatus for combing, apparatus for twisting, came from the factories of the best French constructors, MM. Nicholas Schlumberger, Stehelin & Co., Mord, and others. The looms are of the system of Hodgson, of Bradford, England. The manufactory contains 12,000 spindles, of which 2,000 are adapted to the long wools of Cigaja and of Wallachia, and 1,000 to merino wools. It works up 560,000 kilograms of wools, produces 260,000 kilograms of yarns, which are sold almost entirely in the country.

In six months of fabrication the *Kammgarn-Spinnerei* realized a profit of 25 per cent. upon its capital. These profits are to be converted into capital in order to extend the industry. The labor of the factory is exclusively Hungarian, with the exception of the foremen, who have all been drawn from the factories of Alsace. The establishment employs one hundred and fifty workmen and two hundred and fifty women, who work by the piece. The men earn from 2 francs 75 centimes to 6 francs 50 centimes, and the women from 1 franc 50 centimes to 3 francs per day of twelve hours. The raw material employed has a value of 5 to 6 francs per kilogram for *merino*, and from 4 to 5 francs for *Cigajo*. The products fabricated of merino are worth 11 francs per kilogram; the other is estimated at 8 francs 30 centimes. The wool is not subject to any import-duties in Hungary, while manufactures analogous to those of the *Kammgarn-Spinnerei* are protected by a duty of 8 florins (20 francs or $4) per hundred kilograms. Already the *Kammgarn-Spinnerei* is not equal to local wants; the increase of wealth in Hungary will certainly bring about a greater consumption of this product purchased almost exclusively by the middle and wealthy classes. Ultimately the importance of the market for raw material, commercial relations and media of communication, daily

augmenting, will, some day, permit the Hungarians to seek connections with the Danubian provinces, and perhaps to extend them even as far as Constantinople.

FACTS FROM VARIOUS SOURCES.

LARGE PROFITS FROM SMALL FARMS.—We have received from the corresponding secretary of the Farmers' Club at Farmingdale, Queens County, New York, a copy of a paper read before it by its president, J. W. DeLee Ree, the design of which is to show "how a living is made on a twenty-acre farm on Long Island." The steps by which the conclusion is reached are here given in a condensed form. It being premised that small farms prevail on the island, thirty acres being considered enough for a farmer to carry on, with the help of one or two boys, and that the larger farms prove to be less profitable than the smaller in proportion to the acreage, it is represented that ordinarily farms of twenty acres, in the central part of the Island, thirty to forty miles from New York, are worked in the manner and with the results following. When practicable, such a farm is divided into seven parts, six of which are three-acre lots for tillage, and the seventh is occupied with the buildings, poultry yard, kitchen-garden, and an orchard of about one hundred and fifty apple and pear trees. Other fruit-trees, such as cherry, are planted by the road-side, and so answer the triple purpose of ornament, shade, and fruit. Grass being the great desideratum, a good farmer does not rest satisfied until he makes his fields yield at the rate of two tons to the acre the first year, without much shrinkage for the next two years. With this view rotation is practiced, and usually a six-year course, in the following order. The first year, corn is planted on sod ground, with manure in the hill; the second roots, sufficiently manured to be followed by wheat the third, and by grass the three succeeding. Half the eighteen acres is thus kept in grass, three being broken up each spring, and three seeded down each fall. But, if one acre is planted with (say early rose) potatoes, they can be harvested in season to sow the same by the first of August with turnips, yielding four hundred to six hundred bushels. If the farm contains twenty-three acres, another lot and another year is added, corn being planted two years in succession; if twenty-six acres, grass-seed is sown when the corn receives its last dressing the second year; the field is grazed one year, then roots, wheat, and grass follow. On a twenty-acre farm, tilled as above described, the crops, well cared for, will average about as follows: three acres of corn, 55 bushels per acre, at 90 cents per bushel, $148.50; three acres of potatoes, (or an equivalent in roots,) 200 bushels per acre, at 65 cents per bushel, $390; three acres of wheat, 25 bushels per acre, at $1.75 per bushel, $131.25; nine acres of grass, $1\frac{2}{3}$ tons per acre, at $20 per ton, $300; profit on two hundred hens kept for eggs, $1.50 each, $300; on two cows, $75 each, $150; on orchard, $2 per tree, $300; total, $1,719.75. Outgoes: for board of team, at $1 per day, $365; for manure purchased, $200; interest on farm and buildings, valued at $3,000, and stock and tools, valued at $1,000, at 7 per cent., $280; taxes, $20; total, $865. This deducted from $1,719.75 leaves a net profit of $854.75. Add to this the profits from the garden, the bees, the pigs, &c., and it will give a clear income of about $18 per week the year round. That is, the judicious and industrious cultivator of a twenty-acre farm receives a salary equal to that of a first-class mechanic, besides the advantages of outdoor instead of indoor labor, of great variety instead of monotonous uniformity in his work, and espe-

cially of being his own master, which, to a person of independent, self-reliant spirit, is of no small account. It may be thought that, all the hay being reckoned at market-value, the profit on the cows is put too high; but the straw and corn fodder, (or their avails,) and what turnips can be raised after a crop of early potatoes, will afford abundant feed for two cows through the winter. There is no cheaper way to keep cows in first-rate order than to raise turnips enough to feed one bushel per day to each through the winter. On some small farms as many as five cows are kept. In that case less hay is cut, and what is is chiefly fed out. Consequently more manure is made and less bought. But the more cows the more work in the house, and as the usual aim is to get along without outside help, the sources from which profits are sought on the farm are often regulated by the state of the family in respect to the relative amount of outdoor and indoor help it affords. The fact is not overlooked that all small farms do not yield a profit equal to the above estimate; while some are made to exceed it, others are made only to yield a bare subsistence. But in the latter case the failure can always be traced either to a soil of poorer than average quality, or to a lack of intelligence and aptitude for acquiring it, or a lack of sound judgment, or of industry, or some similar cause.

EXPERIMENTS IN POTATO CULTIVATION.—The following statement is received from J. V. H. Scovill, of Paris, Oneida County, New York:

Many practice the habit of selecting only small potatoes for seed, reserving those that are merchantable for sale. Others plant medium-sized potatoes, cutting only the largest. Some practice shallow planting; others plant more deeply and dig them with a machine. I have made some experiments during the past season to ascertain, if possible, what is the best kind of seed to use. The ground used for this purpose was a clay loam, and was an inverted green-sward, ploughed about seven inches deep. The potatoes were planted in hills, the rows being 3 feet by 2 feet 9 inches apart, making 5,280 hills to an acre. The number of hills planted of each kind was seventy, and the result figured out as if by the acre. The seed was carefully weighed, both at the time of planting and at the time of digging, and was estimated at the rate of sixty pounds to the bushel. The rows were marked with a horse-marker and the seed covered about two inches deep. The variety experimented with was the Garnet Chili, a variety largely cultivated in Central New York for local marketing. They were planted June 1, and harvested October 21.

Number.		Seed used per acre.	Large potatoes per acre.	Small potatoes per acre.	Total products per acre.
		Bush. of 60 lbs.	*Bush. of 60 lbs.*	*Bush. of 60 lbs.*	*Bush. of 60 lbs.*
1	One eye to a piece, and one piece in a hill	3¼	102½	5⅓	108
2	One eye to a piece, and two pieces in a hill	9 1-6	175½	16	191⅓
3	Two eyes to a piece, and one piece in a hill	8 4-5	160⅓	14⅔	175⅓
4	Two eyes to a piece, and two pieces in a hill	13½	173	21⅓	194⅓
5	Three eyes to a piece, and one piece in a hill	10⅔	175⅓	21⅔	197¼
6	Three eyes to a piece, and two pieces in a hill	18⅓	164⅓	41⅓	205⅔
7	Four eyes to a piece, and one piece in a hill	12⅓	156⅓	22½	179
8	Four eyes to a piece, and two pieces in a hill	27⅓	146⅔	47	193⅔
9	One large potato in a hill	44⅓	168	62	230
10	One large potato divided, in a hill	22	163	28⅔	191⅓
11	One small potato in a hill	10⅓	138	23	161
12	One small potato divided, in a hill	6⅔	125	18	143
13	Two small potatoes in a hill	21⅔	132⅔	46⅓	179⅓
14	One medium potato in a hill	26⅓	159	36⅔	195⅔
15	One medium potato divided, in a hill	16¾	154⅔	26⅔	181⅓
16	Seed end of the potato in a hill	12	158	24¼	182¼
17	Potato, with seed end cut off, in a hill	29	156⅔	38	194⅔
18	Two medium potatoes cut in two, four pieces in a hill	30¾	191	38	229
19	One medium potato quartered, four pieces in a hill	27⅓	168	62	230
20	One large potato in a hill, with eyes dug out	35	114	14⅓	128⅓
	Field-crop	.....	156⅓	28	184
	Field-crop, Peach-blows	.....	194	21¼	215¼

Some very interesting and curious facts are observable from a perusal of the foregoing table. The strongest seeding, in almost every case, furnishes the most flattering results. The largest yield were those of Nos. 9 and 19. 230 bushels to an acre, and a difference of about 17 bushels in amount of seed used, while the proportion of small potatoes was unusually large. The best proportion of large potatoes was in Nos. 2, 4, and 5, and largest amount in No. 18. Two eyes to a piece and two pieces in a hill, and three eyes to a piece, are better than two single eyes; while three eyes to a piece and two pieces in a hill give 11 bushels less of large ones than a single piece of the same number of eyes, and nearly double the number of small ones, as will be seen by referring to Nos. 5 and 6.

I find this minute in my memorandum at the time of planting, referring to Nos. 5 and 6: "The labor of cutting with three eyes to a piece is increased, and most of the seed ends thrown out." Also of Nos. 7 and 8: "Seed ends left in and generally divided, and sometimes more than four eyes to a piece and less care in cutting." No. 20, one large potato, eyes dug out. Of the seventy hills planted ten did not grow, and three of these were dug up and destroyed by fowls. I am satisfied that the proportion of those which did not germinate would have been less had the planting been earlier. Everything which resembled an eye was carefully dug out, and the potatoes were all carefully examined by other parties previous to planting. What does it prove? It proves the wonderful vitality of the potato, and that the cutting and planting may be done with a machine without fearing any material risk or damage from missed hills.

From the result of these experiments my previous opinions are confirmed, and I would say use good seed and avoid the danger of a depreciating quality by feeding the small ones to your stock. I usually plant a good medium sized potato, and, if large, cut it once in two lengthwise. The "field crop" noticed was grown alongside the above, and was, I think, less than my general crop.

These potatoes were grown in the town of Paris, Oneida County, New York, in an elevated locality, 1,500 feet above the level of the sea.

VINEYARD LANDS.—Our regular correspondent in Amador County writes as follows:

This county is situated on the western slope of the Sierras, extending from the summit to the foot-hills, with a breadth from north to south of thirty miles, and an altitude of 75 to 10,000 feet above tide-water. Beds of lava, indurated volcanic ash, breccia, and bowlders, remains of the volcanic epoch, are found all the way from the summit to some miles out on the plains, forming prominent landmarks all over the county. Every stream and gulch contains more or less of the broken-down matter of these beds, and without an analysis of the soil it is safe to conclude that it all contains a considerable quantity of volcanic *débris*. The slopes around these volcanic deposits have proved to be the paradise of the grape, where all kinds, whether from the borders of the Mediterranean or the Northern Rhine, flourish better than in their native homes.

The vines are usually planted 8 feet apart each way, the ground being previously plowed as deeply as convenient, say 8 to 12 inches. Rooted vines are preferred, as coming sooner into bearing and requiring less care than cuttings. They are trained to a height of 12 to 24 inches and staked up, for convenience in cultivating only, for the vines will bear equally as well, and, in the opinion of many, better, if laid flat on the ground, as there is no rain or dew to cause mildew or rot after the setting of the grape. The pruning may be done from November to March, in clear, sunny weather, as pruning in damp weather, however early in the winter, will cause the vine to bleed severely whenever the sap starts. They are trimmed to a close head, not more than three buds being left on a spur, and these all to be cut away the following year if buds nearer can be found. If the vines can be irrigated once or twice in June and July, they make a larger growth and come into bearing sooner. After the vine is pruned it is treated much like corn in the Western States, plowed with a bull-tongue shovel-plow, or anything that will loosen the ground to the depth of 3 or 4 inches, and all the suckers removed. After the trains cease they require no more attention except thinning out of the fruit, which is but little if the vines were properly pruned. A few bunches will be found the second year, and the fourth year a good crop will be obtained—two and a half to five tons to the acre. One man with a horse and plow will tend twenty acres, including pruning, suckering, cultivating, and gathering.

Gathering commences in October, and may be continued until December or even later, as the only loss is from birds and wild animals. It will be seen that but little work is required during the months of July and September, the hottest months of the year.

If the vines can be irrigated the yield may double the above estimate. The grapes will be improved for table use, being larger and of a milder flavor, but are not so valuable for wine, owing to the excess of watery matter. The writer of this article has more than once picked small patches of grapes yielding at the rate of sixteen tons to the acre.

It is quite possible to make a large vineyard yield that occasionally, though such overbearing injures the vines very much. Only moderate crops can be relied on every year.

The liabilities to failure if the site is well selected and the land well tended do not amount to 1 per cent.

Vineyards on low, moist lands are liable to mildew and late and early frosts. An elevation of 10 or 20 feet above the zones of cold air in the valleys insures against all loss by frost or mildew. In consequence of the want of transportation, grapes were worth in 1872 but $15 per ton, and demand limited at that.

Fully one-half the land of this county, below the altitude of 3,000 feet, is adapted to the cultivation of the grape in patches of five to forty acres, without further expense than clearing off the brush and fencing. Much of this land is now subject to pre-emption and homestead.

A railroad from tide-water is projected, and will probably be built in a short time, which will reach the center of this vine-land. No part of the United States holds out greater inducements for men of small capital who wish to engage in the cultivation of the grape.

STOCK ITEMS.—The following items are from our April correspondence:

Cambria County, Pa.—Many individuals are procuring Alderney cows for their own private use. The cost is from $150 to $250 each, the price being regulated by age and purity of blood. They are regarded as being profitable even at the high price they cost. The Cambria Iron Company of this place own many farms which they have bought for the minerals, iron ore, and stone coal, and being desirous of giving an impulse to the agricultural interests of the county, are devoting both skill and means to that purpose. They have procured a competent superintendent, and have purchased the best of utensils and machinery for cultivating the different farms, and have commenced the establishment of distinct herds of thoroughbred cattle. They have placed Alderneys on one farm, Devons, Short-Horns, and Herefords, each, on others. As these herds are of recent establishment, we cannot give full information with regard to their comparative profits, though the Herefords have proven to be profitable, there being a very great demand for the calves at prices averaging $50 at from four to six months old.

Hot Spring County, Ark.—The Chinese or Poland hog seems to have been the most profitable stock imported here. A gentleman in my neighborhood bought one pair, which cost him $28 for the pair. He has sold pigs from them for $20 apiece. The pair has netted him $410 in eighteen months. The total amount of cost and feed in that time was $65, making a clear profit of $345.

Tuolumne County, Cal.—Some attention is paid to crossing the common goat with the Angora. The grades are not sufficiently high for shearing, but there is great improvement in the fattening qualities and in the flavor of the meat. The skins of three-quarter and seven-eighth grades make beautiful robes; livery-stable keepers are anxious to get them, and prefer them to any other robes, being handsomer and more durable.

REMEDY FOR LEECHES IN THE LIVER OF SHEEP.—Our correspondent in Clackamas County, Oregon, having read the description of the symptoms of leeches in the liver of sheep, as given by our correspondent in Lane County, and published on page 521 of the monthly reports for 1872, states that, fifteen to eighteen years ago, a disease prevailed among sheep in Clackamas County, of which the symptoms were in all respects the same, and it was ascertained that they originated in the same cause. The local name by which the disease was then known was "swelled jaw." Hundreds upon hundreds of sheep died of it. After many ineffectual experiments for remedies had been tried, a farmer dissected one of the many sheep which had died out of his flock and found its liver filled with leeches. Among other applications to the living leeches, he tried saleratus, and found that it killed them immediately. He then mixed saleratus with the salt given to the diseased sheep. They soon began to recover. In a short time all were well. The news of the discovered remedy spread. Others tried it with equal success. Within a few months there were no sheep in the region affected with the disease, and since that time our correspondent has never heard of another case in the county.

CROP PROSPECTS IN CALIFORNIA.—The following facts and prognosti-

cations are gathered from a communication of a correspondent in Sonoma County. Rains sufficient to fit the ground for plowing and putting in grain fell early in November. The weather was delightful till past the middle of December, but about the time of the winter solstice abundant rains fell, amounting for the season to 9.55 inches. Through January the weather was clear and warm, and the farmers improved it to the utmost. The breadth of grain sown in the State is probably larger than ever before. That sown early, and all that sown by harvesting of last year, called "volunteer crops," looks very fine, standing from three to eight inches high and covering the ground well. The early rains reached all the valleys in the State, and the recent rains have been equally extensive, and have fallen to an average depth of two and a half inches. The maturing of the great body of crops seems to be already insured, even though there should be no further rains. Grass is well up, pastures are fine, and cattle and sheep are doing well. The prospect now is that the agricultural products of California for the coming season will be larger than ever before; the wheat-crop alone promises to reach 30,000,000 bushels. The lowest temperature during the winter was 23½° above zero. Flowers and semi-tropical plants are in blossom, and all things conspire to make the season seem like one long and delightful spring.

HILL-WHEAT.—Messrs. Murray, Davis & Co., publishers of the Cincinnati *Price Current*, have furnished this Department with a sample of wheat known as the "hill-wheat," in the Cincinnati market. It is grown principally in Kentucky, Tennessee, and Southern Illinois. Its name is supposed to have originated from the fact that it is mostly the product of the hilly districts of those States. It corresponds to the amber wheat of more northern latitudes, and ranks between the Mediterranean or red wheat, and the choice white wheat. In the Saint Louis market it is quoted as No. 1 wheat.

NEED OF MORAL EDUCATION IN ARKANSAS.—On page 513 of the monthly reports for 1872 there is a brief article in which are given the results of the different courses of agriculture pursued since the war by two planters of equivalent fortunes, residing in the same locality in Louisiana. The one had pursued the ante-war method, and adhered to the culture of cotton alone, the other had recognized the new conditions consequent upon the war, and adopted the method of diversified agriculture. It is represented that the results are altogether in favor of the latter. Our correspondent in Arkansas County, Arkansas, calls attention to this representation, and wishes to give as the result of his own experience "the other side." He says:

> When the war closed I also tried the diversified plan. I had eight acres in apples, pears, and plums: twelve acres in peaches; a fair lot of improved hogs, and a nice lot of sheep. My apples are all stolen, so that I never have any to put up for winter. My hogs have long since been stolen. I have cut down my peach-orchard. If I plant a garden and have a nice lot of vegetables, they are all stolen. If I put up a nice crib of corn, the lock is forced and my corn is stolen. So I have come down to cotton and just enough corn to make my crop. Money can be made by that system if one only attends to his business and doesn't spend too much. Still, I will admit that the diversified system is much better, and there is more money and more happiness in it; but there are some things people cannot do.

The concluding statement, so far as it applies to the case in hand, seems to need qualifying thus: there are some things people cannot do until they have first done some other things. The difficulty which our correspondent found so trying that he was discouraged by it is one which exists in every section—North, East, and West, as well as South—

where the mental and moral education of any considerable portion of the population is long neglected, and one which does not exist to such an extent as to be a serious hinderance to diversified agriculture and the plenty and happiness it brings in any section where free schools and churches, within the reach of all, have been in operation long enough to produce their legitimate effects.

AGRICULTURAL REPORTS OF ODESSA.—During 1872 the agricultural reports of Odessa, Russia, embraced 3,838,000 tschetwerts* of wheat; 363,600 of rye; 57,800 of maize; 315,250 of barley; 46,000 of oats; 13,050 of peas; 151,800 of linseed; 115,500 of rape and other seeds; 130,500 pouds of flour; 334,100 of wool; 40,600 of tallow. Compared with 1871, the wheat exports show an increase of 40,000 tschetwerts; peas, linseed, and other seeds also increase their aggregates. Rye, maize, barley, and oats, however, fell off heavily, especially maize, which indicates a loss of 358,200 tschetwerts. Flour exports more than doubled, while wool and tallow show very large increments. During the year 541 sail-vessels and 504 steamers cleared from the port with freight. The sail-vessels have declined in number from 996 in 1870 and 797 in 1871. The steamers, on the contrary, enlarged from 300 in 1870, and 425 in 1871. Of the sail-vessels, the larger number—191—were Italian; of the steamers, the greater number—270—were English. Only 41 sail-vessels and 120 steamers were Russian.

FARM STOCK AND PRODUCTS IN NEW MEXICO.—An occasional correspondent, writing from Colfax County, New Mexico, January 25, 1873, gives some agricultural information gained through his own observation and experience during a year's residence. The winter of 1871–'72 was considered a very severe one. All kinds of stock, except those housed and fed, which were few and far between, suffered greatly. In April it seemed as though all would die, but, though cold and hunger had consumed everything except "skin and bones," the most of them survived. The hard winter was followed by a drought which continued till late in the summer; but then, in consequence of frequent and abundant rains, grass became plentiful and luxuriant, and in the fall cattle had become so fat that it would do one good to look at them. This winter, thus far, there has been little wind, no snow, and generally mild and pleasant weather, very different from the severely cold weather which has prevailed in the States and in the Territories north. Our correspondent resides on high land near the Montezuma and Aztec mines, and in that neighborhood cattle are wintering well, steers and barren cows being still fat enough for good beef. Cattle and sheep in the lower valleys are also now in fine condition. But, as few stock-raisers make any provision for sheltering or feeding their flocks and herds, should the latter part of the winter bring snow-storms and cold, high winds, if they do not perish, they will again come out in the spring reduced to "skin and bones."

The writer houses his milch-cows and feeds them on Hungarian hay at night, letting them run out in the day-time. For his other stock he has built stables and sheds as shelters in time of storms and cold winds, and in spells of severe cold he feeds them on oat-straw. Thus protected from suffering, he is confident they will come out in spring almost as fat and sleek as they were in the autumn.

As to the state and style of agricultural industry, he represents that you have but to think of its condition in Mexico one or two hundred years ago, and you get a pretty correct idea of what it is now in New Mexico. Nevertheless, as one bushel of grain will go about as far there in feeding stock as three will in the States, and as corn and oats are

* A tschetwert is 5.95205 bushels.

worth in money about three times as much as in the States, it is thought that, in view of the limited amount of means, intelligence, and industry invested, the husbandman is there abundantly rewarded. Besides cereals, beans, pease, most varieties of cabbage and root-crops, and other garden-vegetables thrive and grow to great perfection.

It is alleged by our correspondent that Colfax County is cursed with a "land-grant," made to Beauvian and Maranda, and subsequently sold by L. B. Maxwell to an English company, who claim under it almost the whole county. Until recently settlers have respected their claim, but now, under the current belief that it is extended far beyond the original grant, they are "settling all over the county."

FARMERS IN COUNCIL.—The farmers of Montgomery County, Maryland, recently held a convention at Sandy Spring, at which some agricultural topics of practical importance were discussed and acted on. One was whether any means could be devised by which the several farmer's clubs in the county can carry on, in concert, a series of agricultural experiments so as to secure a comparison of definite results. The discussion led to the raising of a committee charged with the duty of making further investigation of the subject. A comparison of views on the question whether the epizooty has left horses enfeebled, resulted in a general conclusion that horses which were overworked or unduly exposed while the disease was upon them, if not permanently injured, were at least left in a delicate condition, and that hence all should treat them with due care and avoid overtaxing them. Mr. William J. Scofield presented a written statement of his dairy operations for the past year. He reported a herd of nine cows, and, reckoning from January 1, 1872, to January 1, 1873, an average of 200 pounds of butter per cow. This was sold at 43 cents per pound, amounting to $774, of which he reckoned $650 as profit. Attention being called to the fact that in Maryland the legal weight for a bushel of oats is 26 pounds, while in the District of Columbia it is 32 pounds, a committee was appointed to bring the matter before the District legislature and endeavor to effect a change. It would seem that the application is to be made to the wrong legislature, since 32 pounds is the prevailing weight in the United States; out of thirty States in which the weight per bushel of oats is fixed by law, it is 32 pounds in eighteen, 30 in five, 33 in two, and 26, 28, 33½, 34, 35, and 36 in many single States.

A RECORD OF COST AND PROFIT ON FARM PRODUCTS.—Mr. Fargo, secretary of the Batavia Farmers' Club, Genesee County, New York, kept, in 1872, a careful account of each item of expense in raising his farm-crops. The record, with the results, is here given:

	Expense per acre.					Proceeds per acre.			
	Manure.	Labor.	Seed.	Interest and taxes.	Total.	Straw and fodder.	Grain and vegetables.	Total.	Net.
Oats	$3 12	$10 28	$1 25	$7 47	$22 12	$6 25	$19 00	$25 25	$3 13
Corn	6 25	13 59	25	7 47	27 56	10 60	22 78	32 78	5 22
Potatoes	.....	16 70	4 62	7 47	28 79	.....	58 66	58 66	29 87
Roots	.....	110 00	5 00	14 94	129 94	.....	250 00	250 00	120 06
Clover	.....	5 00	.....	7 47	12 47	30 00	.....	30 00	17 53

The expense per bushel was, oats, 40 cents; corn, 44; potatoes, 20; roots, 13; the profit per bushel, oats, 6 cents; corn, 16; potatoes, 20; roots, 12; the average profit per acre, about $11.11; total profit, $546.49; the total of acres cultivated, 49½.

PROFIT IN FEEDING SHEEP.—At a recent meeting of the Farmers' Club in Batavia, Genesee County, New York, Mr. George Burt presented the following definite statistics relative to the cost and profit of feeding sheep for market: He paid for 200 sheep for fattening, $915; for keep, two months, $64; 8 tons of hay, at $16 per ton, $120; 4 loads of corn-stalks, $16; 148 bushels of corn, 60 cents per bushel, $88.80; one barrel of salt, $3; interest on money invested, $20.75; total $1,227.55. January 4, he sold 171 sheep, at 8 cents per pound, $1,522.40; 28, at 6⅛ cents per pound, $181.79; one pelt, $1.50; total, $1,705.69; profit on the 200 sheep, $478.14.

Mr. Burt holds that sheep, in winter, should be kept in small flocks, less, rather than more, than 65 in a flock, in yards where they can have free access, at all times, to water; that they should be kept free from all disturbing or exciting causes; that open sheds are better for them than a close barn; and that it is best to feed grain to them whole.

YIELD IN PENNSYLVANIA.—The reports of the several members of the Brady Agricultural Society, Mifflin County, Pennsylvania, make the average yield of the section represented by them to be as follows: wheat, per acre, 13½ bushels; corn in the ear, 87⅕; oats, 36⅗; potatoes, 61¼; clover-seed, 1; hay, 1½ tons. The highest yields per acre reported were, wheat, 24 bushels; corn in the ear, 133; oats, 46.

MAD DOGS IN TENNESSEE.—A recent report from our correspondent in Sevier County, Tennessee, represents that the object of greatest dread in that county was mad dogs, of which more than twenty had been killed within the previous two weeks. There had, as yet, been no human victim, but many hogs and some oxen and cows had been bitten and gone mad.

AGRICULTURAL FEATURES IN KANSAS.—Our correspondent in Chase County, Kansas, sends us a description of the geographical features, soil, climate, and productions of that county, of which the following is a condensation: In the valleys, which abound, the soil is a black loam from 3 to 30 feet deep. The upland is all covered with limestone soil from 1 to 3 feet deep. Along the streams there is timber varying from a mere border to belts half a mile in width. The varieties include burr-oak, walnut, hickory, white and red elm, cottonwood, mulberry, honey-locust, sycamore, box-elder, willow, &c. On the upland there is no timber; except in the bottoms, limestone extends all over the country. As the land rises from the valleys it crops out at different levels in three ranges of ledges. Above a certain height stones disappear, but there is scarcely a location where the finest stone for building cannot be found within the distance of a mile. In the western part of the county gypsum is found.

According to statistics, less rain falls here than farther east, but the most of that which does fall comes during the growing season, June being the rainy and August the dry month. There is scarcely any rain, and but little snow, in winter. The water from wells, which average about 30 feet in depth, is excellent. This is probably the best-watered county in the State. The Cottonwood River, running very nearly through the center of the county, averages 100 feet in width, (banks about 30 feet high,) and this main artery is fed by almost innumerable smaller streams on either side.

Following a wet season there is some fever and ague; but, as wells are dug (affording pure water) and better houses are built, it decreases.

Improved land sells at $16 to $25 per acre; unimproved at $4 to $10; choice lots as high as $15. Probably not more than one-twentieth is improved; the remainder is nearly all owned by railroads and non-residents. The number of inhabitants is about 3,000, and the Gulf States are the only ones not represented by the settlers.

The soil and climate are adapted to all productions cultivated in the same latitude at the East, but especially to wheat. With fair cultivation, in a good season, it is no uncommon thing for fall-wheat to yield 40 bushels per acre; as many as 50 per acre have been raised here; but the average would probably fall to 25, or, it may be, 20. The best grass is called blue-stem; a blue-joint grows in the bottoms tall enough to hit in the face one who is riding through it on horseback. In good seasons it will cut three tons to the acre; average, two tons. The leading productions are cattle, horses, and wheat, cattle predominating. The principal varieties of fruit raised are apples, peaches, grapes, and the various small fruits.

PROGRESS IN TEXAS.—A casual correspondent in Washington County, Texas, writing January 16, reports that in that section there has been an unusual amount of moderately cold weather, but no snow or sleet; that winter rains have been abundant, but not excessive; that stock is coming through the winter in fine condition for spring work, and that the ground is in fine condition for plowing. He states that in each of the years 1871 and 1872 it is estimated that Washington County produced, in addition to an abundant supply of corn, 30,000 bales of cotton. He adds: "There has been a heavy immigration to our county, and farmers have obtained labor more readily this year than any other since emancipation. Land is advancing in price, and there will be an increase of 10 per cent. in the quantity in cultivation in 1873 over that in 1872. The bulk of this will be planted in our great staples, corn and cotton."

NEED OF A NEW SYSTEM OF STOCK-RAISING IN TEXAS.—The following statements are condensed from a report of our correspondent in Nueces County: The severe drought last summer left the older stock mere walking shadows, and the younger not much better. The cold weather began early in November and continued through December, except that for about fifteen days either heavy or drizzling rains fell. This long spell of severe weather occasioned the death of thousands of cattle, and should there be another cold spell the mortality must be still greater. An extensive cattle-raiser states that there are now on the range thousands of cattle which have not strength enough left to travel five miles. If the prevailing system in this county of raising cattle is not changed they will all die out within a few years. The county is now increasing in population; settlements are springing up all over it, and the farmers are endeavoring to protect themselves against the encroachments of cattle-raisers. Many of the latter own but few acres of land, and yet keep from ten to twenty thousand head of cattle, which they permit to roam at will. This, of course, occasions great dissatisfaction, and results in great evil. It is hoped that the State legislature will soon provide an effectual remedy.

HOW TO SUCCEED IN RAISING MELONS AND CUCUMBERS.—A correspondent in Oswego County, New York, describes a process by which, even in that climate, he has "splendid success in raising melons." The description is somewhat lengthy; but as its length results from its

exactness, we will let him convey to the reader all the particulars, without condensation. He says:

Soon as the ground becomes a little warm I plow, and then, selecting a place where the ground is sandy, I dig holes about 20 inches in diameter and 14 to 16 inches deep. Have the holes about 6 feet apart each way. Leave them open a day or two to allow the ground to warm at the bottom; then put into each hole nearly a half-bushel of manure—fresh horse-manure preferred. Stamp down the manure, cover it with the dirt dug out, about 2½ inches deep, and pat down with the hoe. The hill will now be quite *dishing*, say 4 inches or more. Now I place near my melon-patch a cask, into which I put a small wheelbarrow load of fresh cow-dropping and a couple of shovelfuls of night-soil. Into this cask I put the soap-suds and keep it full. If the weather is dry I occasionally moisten the hills from the cask; evening is the best time. About the 20th of May I cut up a thin, tough sod and place it, grass side down, in an old tin-pan, and sprinkle about half an inch in depth of fine sandy loam upon it. On this I put my seeds, *very thick;* then put upon these another sod, as large as the pan, grass side up. Upon this I pour a teakettle-full of boiling-hot water and set the pan near a stove, where it will keep warm. Each morning I pour on a little more hot water. In about three days the seeds will have sprouts about half an inch long. Now remove the upper sod, shake the pan a little, and the seeds will rise from the fine dirt put upon the lower sod. Put twelve or fifteen seeds in each hill after slightly scratching the dirt. *Handle the seeds carefully, so as not to break the sprouts.* Cover about three-quarters of an inch with dirt. By taking this course your vines will in two weeks be as far advanced as they would be in four or five planted in the usual way. Let the weeds grow in and about the hill as a protection from bugs and worms. The vines will grow rapidly, and of course somewhat tall and spindling. If the weather is dry, moisten from the cask two or three times a week, *always at evening.* This will keep the manure moist and in a state of fermentation, causing considerable heat. When the vines have grown about four inches high remove the longest weeds and perhaps some of the vines, and fill in with dirt nearly up to the leaves. By and by, in a moist day, remove the weeds from the hill, leaving them growing around the borders. Thin out the vines to five or six, leaving some for the worms. Keep the dirt well up to the leaves. Your hill will now be nearly level. Finally, thin out to three or four of the most thrifty vines. *Remember the cask.* Take away the old dirt with your fingers and add fresh dirt two or three times a week. The hill will soon become crowning. Make a small ditch around the hills, say two inches deep, and fill this occasionally with suds from the cask. After the vines nearly cover the ground, and the melons are well set and of pretty good size, cut off the ends of the vines. In this way the melons will grow much larger. I raise as large and fine melons here in Amboy, Oswego County, (on the eastern border of Lake Ontario,) as I ever saw on Long Island or anywhere else. It of course demands labor and care; but let any one try this plan and he will find his efforts amply rewarded. I follow the same rule with cucumbers as with melons.

WHEAT AND CORN PRODUCTS OF CASS COUNTY, IOWA.—The secretary of the Cass County Agricultural Society reports:

The Arnautka wheat is a hard, flinty variety. It has been raised in this county two years; is a *prolific yielder*, but of inferior quality, being so hard that it is impossible to make choice flour out of it. It is only worth 75 cents per bushel in this market, where wheat like the Oran from $1 to $1.10 per bushel. Our best wheat is Australian and *soft* Siberian. The Australian is a soft, choice wheat, and yielded as high as 40 bushels per acre last season. This is a good wheat county. Of the crop of 1872, up to present date, there have been shipped from this point, Atlantic, over 200,000 bushels, at an average price of $1 per bushel. Of corn there are cribbed in this place 100,000 bushels; 50,000 bushels have been shipped, and only a small part is in as yet. All has been bought at 15 cents per bushel. It is now worth 17 cents.

EXHAUSTED SOILS RENOVATED WITH COTTON-STALKS.—Our correspondent in Murray County, Georgia, writes:

The raising of corn, wheat, and stock for the use of the farm, and, beyond that, cotton, is certainly the true policy for the farmers of this county. Cotton pays better than any other crop, but not well enough to justify one in raising it altogether and buying his own provisions. An experiment came under my observation which proves that cotton, so far from exhausting the soil, is a great renovator when properly managed. My son-in-law took two acres of old, worn-out, completely exhausted land, four years ago, and planted it in cotton. Each winter, after the stalks had become tender, he took a stick and beat them in pieces; then run a long bull-tongue plow, as deep as

a strong mule could pull it, under the roots of the old stalks, and with a one-horse turning-plow threw all the old bolls and stalks on the ridge. This he did each year, and did not suffer any stock whatever to go on the lot. The crop nearly doubled itself each year; the first year it made 350 pounds of seed-cotton, the last 2,200 pounds. No manure whatever was used.

GRAPE-CULTURE IN OREGON.—A correspondent in Jackson County, which borders on California, reports that in that section experiments in grape-culture have proved entirely successful. That county already manufactures most of its wine for home-consumption, and those regarded as good judges of wine pronounce the quality excellent. As a result of this successful trial, several vineyards have been greatly enlarged this season.

AVERAGE YIELDS IN ILLINOIS.—The secretary of the Butler Agricultural Club in Montgomery County, Illinois, reports that the members raised, in 1872, products as follows: Total acres of wheat, 465; product, 6,304 bushels; average yield, 13½ bushels per acre. Acres of corn, 708; product, 30,745 bushels; average per acre, 43½ bushels. Acres of oats, 326; product, 16,400 bushels; average per acre, $50\frac{4}{13}$ bushels. Acres of meadow, 342; product, 548½ tons; average per acre, $1\frac{3}{5}$ tons. Acres of Hungarian grass, 15; product, 25 tons; average per acre, $1\frac{2}{3}$ tons.

AGRICULTURAL PRODUCTS OF SANTA CRUZ.—The island of Santa Cruz (under the jurisdiction of Denmark) has an area of about sixty square miles, and, according to a census taken in 1870, a population of 23,194, in which there were 1,022 more females than males. The surface of the island, which has scarcely a running stream, is generally elevated and rolling, in some parts mountainous. Its scenery is represented to be charmingly picturesque and fascinating, and its highways, kept in perfect order, to be almost equal in attractions to the drives in the Central Park of New York. Its agricultural industry is almost wholly limited to the production of sugar, molasses, and rum from cane. It is estimated that at least four-fifths of the provisions, lumber, and implements of culture and manufacture for the supply of the plantations are imported from the United States, while by far the largest portions of the molasses and rum produced are exported to the United States. The sugar is chiefly exported to Denmark. The crop of sugar in 1871, amounting to 16,000 hogsheads, was much larger than had been produced for many years previous. The exports of the island, for the year ending September 30, 1871, were 23,618,873 pounds of sugar, of which the value was $1,136,564.79; 1,054,568 gallons of molasses, value, $243,394.83; and 358,894 gallons of rum, value, $78,602.95. The total value of its exports to the United States for the same year was $834,336.42, which was $433,389.99 in excess of the value of its exports to this country the preceding year.

MARKET PRICES OF FARM-PRODUCTS.

APRIL, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month.

Articles.	Price.
NEW YORK.	
Flour, superfine State...per bbl.	$6 15 to $6 75
extra State ...do...	7 00 to 8 35
superfine western ...do...	5 90 to 6 65
extra to choice western, per barrel ...	6 90 to 12 75
southern shipping, common to choice ..per bbl.	6 10 to 8 25
southern family, ordinary to choice ...per bbl.	8 40 to 12 75
Wheat, No. 1 spring ...per bush.	1 75 to 1 80
No. 2 spring ...do...	1 59 to 1 69
winter, red, west'n...do...	1 70 to 1 87½
winter, amber, western, per bushel ...	1 80 to 1 97½
winter, white, western, per bushel ...	1 85 to 2 25
Rye...per bush.	88 to — —
Barley ...do...	1 15 to 1 19
Corn ...do...	64 to 79
Oats ...do...	45½ to 55
Hay, timothy, fair to choice, per ton...	24 00 to 30 00
shipping grades...per ton.	20 00 to — —
Pork, mess ...per bbl.	16 50 to 16 75
extra prime ...do...	— — to 13 50
prime mess ...do...	15 75 to 16 75
Lard ...per lb.	8¼ to 9 1/16
Beef, plain mess...per barrel.	9 00 to 11 75
extra ...do...	12 00 to 13 50
Butter, western ...per lb.	18 to 31
State dairy ...do...	32 to 48
Cheese, western, factory...do...	12 to 15
State factory ...do...	13½ to 17
Cotton, ordinary to good ordinary ...per lb.	15⅝ to 17½
low middling to good middling ...per lb.	19 to 22⅜
Tobacco, lugs, all grades...do...	7¼ to 8½
common to medium leaf ...per lb.	8½ to 10½
Wool, American Saxony, fleece, per pound ...	63 to 73
American merino, full blood ...per lb...	63 to 73
American, combing...do...	63 to 73
pulled ...do...	42 to 55
California spring clip, unwashed ...per lb.	32 to 39
California fall clip, unwashed ...per lb.	22 to 27
Texas ...do...	20 to 38
BOSTON.	
Flour, western, superfine..per bbl.	5 50 to 6 00
western extras ...do...	6 75 to 9 00
western choice ...do...	9 50 to 12 00
southern extras...do...	6 75 to 7 25
choice Baltimore ...do...	10 00 to 12 00
Wheat...per bush.	1 60 to 2 00
Rye ...do...	95 to 1 00
Barley ...do...	90 to 1 20
Oats ...do...	48 to 57
Corn, southern yellow...do...	72 to — —
western yellow ...do...	72 to 73
Hay, eastern and northern, per ton...	18 00 to 28 00
Beef, western mess...per bbl.	12 00 to 12 50
western extra...do...	13 00 to 14 00
Pork, prime ...do...	12 75 to 13 50
mess ...do...	16 25 to 16 50
Lard ...per lb.	8¾ to 9½
Butter, N. Y. and Vt ...do...	20 to 40
western ...do...	18 to 32

Articles.	Price.
BOSTON—Continued.	
Cheese, N. Y. and Vt. factory, per pound...	$0 12 to $0 17
N. Y. and Vt. dairy, per pound ...	11 to 16
Ohio factory, good to choice ...per lb.	13 to 16
Cotton, ordinary to good ordinary ...per lb.	14 to 17¾
low middling to good middling ...per lb.	19 to 22½
Tobacco, lugs ...do...	8½ to 10
common to medium leaf ...per lb.	9½ to 10½
Wool, Ohio and Pa ...do...	50 to 62
Michigan ...do...	50 to 55
other western ...do...	48 to 55
pulled ...do...	20 to 55
combing fleece ...do...	60 to 65
California ...do...	18 to 35
Texas ...do...	18 to 30
PHILADELPHIA.	
Flour, superfine...per bbl.	5 00 to 5 50
Pa. extra...do...	7 25 to — —
Pa. family ...do...	8 00 to 9 00
western family...do...	7 50 to 8 25
western, fancy ...do...	8 37½ to 12 00
Wheat, winter red, western, per bushel ...	1 85 to 1 95
winter, amber, western, per bushel ...	1 95 to — —
winter, white, western, per bushel ...	1 90 to 2 12
spring...per bush.	1 68 to 1 95
Rye ...do...	82 to 83
Barley ...do...	90 to 1 22
Oats, western, mixed ...do...	46 to 48
western, white ...do...	48 to 50
Corn, yellow ...do...	59 to 61
white ...do...	60 to 65
Hay, fresh, baled...per ton.	24 00 to 30 00
common to fair shipping, per ton ...	20 00 to 24 00
Beef, western mess ...per bbl.	8 00 to 10 00
extra mess...do...	10 00 to 12 00
Warthman's, city, family ..do...	16 00 to — —
Pork, mess...do...	17 00 to 17 25
prime, extra...do...	14 00 to — —
Lard ...per lb	8¾ to 11½
Butter, choice...do...	35 to 45
good ...do...	28 to 35
Cheese, N. Y. factory ...do...	16 to 17
Ohio factory ...do...	15 to 16
Cotton, ordinary to good ordinary ...per lb.	15 to 19
lowmiddling to good middling...per lb.	18¾ to 21
Wool, Ohio common to XX...do...	40 to 55
Colorado, washed ...do...	24 to 27
combing and delaine..do...	60 to 76
pulled ...do...	25 to 46
unwashed ...do...	30 to 35
BALTIMORE.	
Flour, superfine ...per bbl.	5 00 to 8 50
extras ...do...	6 50 to 9 75
family and fancy ...do...	8 25 to 12 00
Wheat, white, fair to choice, per bushel ...	1 85 to 2 10
amber, choice..per bush.	2 10 to 2 12
red, common to prime, per bushel...	1 60 to 2 05

Market prices of farm-products—Continued.

Articles.	Price.		
BALTIMORE—Continued.			
Wheat, red, western ...per bush.	$1 65	to	$1 75
Rye, common to prime .....do...	80	to	90
Corn, white southern.....do...	63	to	65
yellow southern.....do...	60	to	— —
mixed western .....do...	60	to	— —
Oats, southern .....do...	46	to	49
western .....do...	45	to	49
Hay, western, good.....per ton.	25 00	to	30 00
Pork, mess .....per bbl.	16 50	to	16 75
Beef, Baltimore mess.....do...	15 00	to	20 00
extra ....do ...	23 00	to	25 00
Lard .....per lb.	8¼	to	9½
Butter, N. Y .....do...	33	to	42
choice western .....do...	36	to	40
good, to prime western, per pound	24	to	32
Cheese, eastern.....per lb.	17½	to	— —
western .....do...	16½	to	17
Cotton, ordinary to good ordinary .....per lb.	16	to	17½
low middling to good middling.....per lb	18½	to	19½
Tobacco, lugs .....per cental	7 50	to	8 50
common to medium leaf, per cental.....	8 50	to	11 00
Wool, fleece-washed, common to fine .....per lb.	— —	to	— —
tub-washed .....do...	55	to	60
unwashed .....do...	35	to	38
pulled .....do...	35	to	40
CINCINNATI.			
Flour, superfine .....per bbl.	5 25	to	5 75
extra .....do...	7 00	to	7 35
family and fancy ....do...	7 40	to	9 00
Wheat, red winter, No. 1, per bushel	1 68	to	1 70
red winter, No. 2, per bushel	1 60	to	1 65
white.....per bush.	— —	to	— —
Rye .....do...	79	to	80
Barley .....do...	50	to	90
Corn .....do...	38	to	40
Oats .....do...	31	to	38
Hay, baled, No. 1.....per ton.	19 00	to	21 00
lower grades .....do...	15 00	to	18 00
Beef, plate.....per bbl.	14 00	to	— —
Pork, mess .....do...	16 75	to	17 00
Lard .....per lb.	8⅛	to	8½
Butter, choice .....do	37	to	40
prime .....do	34	to	36
fair to good.... .....do	28	to	32
Cheese, factory, good to choice, per pound	15½	to	16½
pine-apple .....per lb.	22	to	23
Cotton, ordinary to good ordinary .....per lb.	12½	to	15¾
low middling to good middling .....per lb.	17¾	to	20
Tobacco, lugs .....do...	— —	to	— —
common to medium leaf, per pound.....	— —	to	— —
Wool, fleece-washed, common to fine ....per lb.	45	to	48
tub-washed .....do...	48	to	50
unwashed, clothing .do...	30	to	32
unwashed, combing .do...	40	to	45
pulled .....do...	35	to	36
CHICAGO.			
Flour, white winter extras, fair to choice.....per bbl.	8 25	to	10 75
red winter extras ...do...	7 00	to	8 50
good to choice spring extras.....per bbl..	5 75	to	6 75
spring superfines ...do...	3 00	to	4 75
good to fancy Minnesota, per barrel.....	6 50	to	8 50

Articles.	Price.		
CHICAGO—Continued.			
Wheat, No. 1 spring ...per bush.	$1 26	to	$1 28
No. 2 spring.....do...	1 17	to	1 19½
No. 3 spring.....do...	1 07	to	1 09½
Rye, No. 2.....do...	64½	to	65½
Barley, No. 2 .....do...	75	to	78
Corn, No. 2 .....do...	30½	to	33
Oats, No 2 ....do...	24½	to	26
Hay, timothy. .....do...	13 50	to	16 50
prairie .....do ..	9 00	to	10 50
Pork, mess .....per bbl.	15 00	to	— —
Beef, mess .....do...	9 00	to	9 50
extra mess.....do...	10 00	to	10 50
Lard .....per cental.	8 00	to	8 15
Butter, strictly choice dairy p. lb	30	to	33
common to choice roll, per pound.....	20	to	27
Cheese, N. Y. factory.....per lb	17	to	18
Ohio factory .....do...	16	to	17
western factory....do...	15	to	17
Wool, tub-washed.....do...	51	to	61
fleece-washed.....do...	40	to	53
unwashed .....do...	28	to	33
pulled .....do...	42	to	46
NEW ORLEANS.			
Flour, superfine .....per bbl.	5 12½	to	5 90
extra.....do...	6 25	to	8 25
choice.....do...	8 50	to	10 50
Corn, white .....per bush.	58	to	60
yellow .....do...	58	to	59
Oats .....do...	44	to	45
Hay, prime.....per ton.	25 00	to	27 00
choice .....do...	27 00	to	27 50
Pork, mess .....per bbl.	17 25	to	17 50
extra prime.....do...	— —	to	— —
Beef, Texas .....do...	11 50	to	12 50
western and northern .do...	15 00	to	16 50
Fulton market .per half bbl.	12 25	to	— —
Lard .....per lb.	8½	to	9¾
Butter, choice western .....do...	30	to	32
choice Goshen .....do...	44	to	45
prime Goshen .....do...	40	to	42
Cheese, choice western factory, per pound	17	to	17½
New York cream .per lb.	19	to	20
Cotton, ordinary to good ordinary .....per lb..	13½	to	17¾
low middling to good middling.....per lb.	18½	to	20¾
Tobacco, lugs .....do...	8	to	9
low leaf .....do...	9	to	10
medium leaf.....do...	10	to	11
Wool, lake .....do...	30	to	35
Louisiana, clear.....do...	25	to	30
SAN FRANCISCO.			
Flour, superfine .....per bbl.	4 50	to	4 80
extra.....do...	5 00	to	5 25
higher grades .....do...	5 50	to	5 75
Wheat, State .....per cental.	1 50	to	1 87½
Oregon .....do...	1 75	to	1 85
Barley .....do...	1 15	to	1 40
Oats .....do...	2 25	to	2 40
Corn, white .....do...	1 25	to	1 30
yellow .....do...	1 20	to	1 25
Hay, State .....per ton.	22 50	to	— —
Pork, mess. .....per bbl.	18 00	to	19 00
prime .....do...	17 50	to	18 00
Beef, mess.....do...	10 00	to	12 00
family mess ...per half bbl.	9 00	to	10 00
Lard .....per lb.	9¾	to	11
Butter, overland .....do...	15	to	20
California.....do...	22½	to	27½
Oregon .....do...	15	to	18
Cheese .....do...	12	to	16
Wool, native .....do...	10	to	12
Californian .....do...	20	to	25
Oregon .....do...	20	to	25

LIVE-STOCK MARKETS.

NEW YORK.

CATTLE.—Thin native steers, dressing 56 pounds per cwt., $10.50 per cental; fancy or premium bullocks, dressing 60 pounds per cwt., $14,50 per cental; actual range of native cattle, $11 to $14 per cental; Texans, dressing 55 to 57 pounds per cwt., $10.37 to $12 per cental. Milch cows $40 to $85, the latter for choice; veal calves, $8 to $11 per cental, live weight.

SHEEP.—$6.25 to $8.75, embracing all grades, from poor clipped to extra unshorn animals.

HOGS.—$6.50 to $6.75 per cental, live weight.

BOSTON.

CATTLE.—Choice beeves, $7.75 to $8 per cental; extra, $7 to $7.50; first quality, $6 to $6.50; second quality, $4.50 to $5.50; third quality, $3.75 to $4. Working oxen $100 to $250 per pair. Milch cows and calves, per head, $35 to $60; extra, $65 to $85; farrow cows, $20 to $30; yearlings, $10 to 18; veal calves, $5 to $15.

SHEEP.—$3.50 to $5 per head; extra, $5.50 to $8 per head, or $5 to $8.50 per cental; lambs, $6 to $8 per head.

HOGS.—Western fat hogs, $6 to $6.25 per cental, live weight.

PHILADELPHIA.

CATTLE.—Beeves in good request; choice and extra, $8 to $8.25 per cental; fair to good, $6 to $7.87½; common, $4 to $5.75.

SHEEP.—Wooled, $7 to $8.25 per cental; clipped, $5 to $6.25.

HOGS.—Corn fed, $9 to $9.25 per cental.

BALTIMORE.

CATTLE.—Best beeves, $6.25 to $7.62 per cental; first quality, $5.75 to $6.25; medium or good fair quality, $5 to $5.75; ordinary, thin steers, oxen, and cows, $4 to $5; general average, $5.75; extreme range, $4 to $7.62; most of the sales were between $5.25 and $6.25.

SHEEP.—Fair to good, wooled, $4.50 to $7 per cental, live weight; good to extra, $7 to $8; clipped, $4.25 to $6.25.

HOGS.—Still-fed, $7.75 to $8.25 per cental; corn-fed; $8 to $8.75; market bare and closing with good prospects.

CINCINNATI.

CATTLE.—Shipping, $5 to $5.50 per cental; extra, $5.75; common to choice butchers' stock, $3 to $5.40; inferior, $2 to $2.75.

SHEEP.—Extra, $6.25 to $6.50 per cental, gross; good to prime, $4.75 to $6; common to fair, $3.25 to $4.50.

HOGS.—Butchers' hogs, $5.60 to $5.90 per cental, gross; extra, $6; shipping grades, $5.15 to $5.50; stock hogs, $4.60 to $4.75.

CHICAGO.

CATTLE.—Extra graded steers, 1,400 pounds and upwards, $6.30 to $6.65 per cental, gross; choice beeves, fine, fat, and well formed, three

to five years old, 1,300 to 1,400 pounds each, $5.80 to $6.15; good beeves, well-fattened and finely-formed steers, 1,200 to 1,300 pounds each, $5.30 to $5.65; medium grades, $4.80 to $5.10; butchers' stock, $3.75 to $4.75; stock cattle, $3.40 to $4.40; Texans, north-wintered, $3 to $3.75; do., corn-fed, $4 to $5.

SHEEP.—Good to choice, $5 to $6 per cental; medium, $4.50 to $4.75; poor to common, $3.50 to $4.25.

HOGS.—Good to choice, $5.60 to $5.70 per cental; medium, $5.50 to $5.60; poor, $5.25 to $5.35.

NEW ORLEANS.

CATTLE.—Western beeves, per cental, net, $11 to $18; Texas beeves, corn-fed, first quality, $8 to $11 per cental, gross; second quality, $40 to $50 per head; Texans, not corn-fed, first quality, $35 to $45 per head; second quality, $20 to $28; third quality, $15 to $18; milch cows, $50 to $80 per head; choice, $80 to $100; calves, $8 to $12 per head; yearlings, $10 to $14 per head.

SHEEP.—First quality, $5 to $7 per head; second quality, $3 to $4.05; third quality, $2 to $2.10.

HOGS.—Seven dollars to seven dollars and fifty cents per cental, gross.

FOREIGN MARKETS.

WHEAT.—The weekly average prices of wheat in London, as reported in the Mark Lane Express, during March, were as follows: 55*s.* 11*d.* per quarter on 3,478 quarters; 55*s.* 8*d.* on 2,738 quarters; 56*s.* on 4,592 quarters; 52*s.* 10*d.* on 2,638 quarters; and 56*s.* 3*d.* on 4,983 quarters. The month opened with a heavy fall of snow, which, though favorable to the growing wheat crop, arrested field-labor for the time being. A mild temperature succeeded, but wintry weather again appeared about the third week. The month closed up with a week of very beautiful weather, giving opportunity for the field-labor which crops so greatly needed, both in England and on the Continent. British markets were dull, though prices were stationary at 1*d.* below those of the same period of the previous year. A heavy importation of foreign wheat, to which California alone contributed a half million quarters, gave assurance of a full supply until harvest, but the condition of the market was by no means cheering to speculators. Russia and Germany were not forthcoming with their usual supplies, yet the export business at Odessa was increasing. Stocks on hand in Europe and America were not large enough to create any special fear of a fall in prices. The home crop of 1872, though under average, had somewhat improved.

In Liverpool, American and European wheat was quite steady, at prices varying but little from those stated in our March report. The Paris market, at the close of March, was drooping, though some holders, in spite of the fine weather, maintained former values. The best white wheat had fallen to 59*s.* per quarter, from 63*s.* two weeks previous. Marseilles had also shown a strong downward tendency, with declining sales. Bordeaux was somewhat lower, (56*s.* 6*d.* per quarter for the best white wheat,) but the French country markets generally were unchanged. The Belgian markets had been firm, with some fluctuation in the middle of the month, but a rising tendency at its close. A decline of freights

had facilitated exports at Odessa, about 230,000 quarters having been sold during February.

FLOUR.—The standing quotations of the Mark Lane Express were the same as stated in our March report. In Liverpool prices had suffered no change. In Paris some decline was induced by the pleasant weather, giving better promise to the growing crops. Holders, however, were disposed to be firm, and but little superior flour was offering. Prices ranged from 42*s.* 3*d.* to 46*s.* 2*d.* per quarter.

INDIAN CORN.—In Mark Lane, London, white maize was quoted all through the month at 31*s.* to 33*s.* per quarter; yellow, at 26*s.* to 28*s.* In Liverpool, at the close of the month, American white brought 30*s.* to 31*s.* per 280 pounds; American yellow, 27*s.* 6*d.* to 28*s.*; Trieste, 30*s.*; Danubian, 28*s.* 9*d.* to 29*s.* 6*d.*; Galatz, 31*s.* to 31*s.* 6*d.*

WOOL.—The London market, at the close of the month, was not favorable to extensive operations in English wools. Fine qualities commanded attention and realized good prices. The standing quotations were the same as at the close of February, and had remained substantially unchanged during the month.

BUTTER.—The closing quotations were as follows: Dorset, 136*s.* to 144*s.* per cwt., showing a decline through the month; Friesland, 120*s.* to 126*s.*; Jersey, 112*s.* to 126*s.*

CHEESE.—American cheese brought 60*s.* to 76*s.* per cwt., about the same as at the close of February; English cheeses were generally lower; Cheshire, 60*s.* to 80*s.*; Double Gloucester, 70*s.* to 78*s.*; Cheddar, 76*s.* to 94*s.*